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INTERACTIVE FICTION: THE COMPUTER STORYGAME "ADVENTURE"

University of California, San Diego PH.D. 1985

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University of California

San Diego

INTERACTIVE FICTION:

THE COMPUTER STORYGAME ADVENTURE

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in German Literature

by

Mary Ann Buckles

Committee in charge:

Professor Martin W. Wierschin, Chairperson
Professor Donald Anderson
Professor David Crowne
Professor Jeffrey Elman
Professor Cynthia Walk

1985

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University of California, San Diego

1985

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For

Helen Lucile Buckles:

"Don't be a martyr, Mary Ann. It's too much work."

Thomas Buckles:

"Don't worry. Things will get themselves done somehow."

and most of all, for JACK WATHEY:

"Don't ever take *#&! off anybody."

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Table of Contents

		Page
	Dedication	iv
	Acknowledgements	vi
	Vita	vii
	Abstract	viii
I	Introduction	1
II	*Adventure* as a Game	29
III	Games and Literature	46
IV	*Adventure* and the Novels of Chivalry and Adventure	65
V	*Adventure*'s Relationship to Mysteries	87
VI	A Structural Analysis of *Adventure*	104
VII	Point of View in *Adventure*	133
VIII	Reader Response	162
IX	References	191
X	Appendix	201

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ABSTRACT OF THE DISSERTATION

Interactive Fiction:
The Computer Story Game Adventure

by

Mary Ann Buckles
Doctor of Philosophy in German Literature
University of California, San Diego, 1985
Professor Martin Wierschin, Chairperson

Adventure and other narrative-based computer games have been labelled interactive fiction. They are written in words in the form of simple scenarios featuring comic-strip type characters with which the reader/player can verbally interact to create stories.

In the opening chapters of this dissertation, the emphasis is on Adventure's affinities with traditional literature. I explore the close relationship between play, games and literature. A discussion of the traditional literary models and narrative strategies that are used in its story follows. The similarities and differences between Adventure and conventional stories of detection are del-

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ineated, because both types of stories have as their primary goal the solution of a narrative puzzle. A Proppian structural analysis of Adventure indicates that although many elements, functions, and moves described by Propp in simple folktales form the structural basis of Adventure, it still cannot be considered a folktale. I compare Adventure, the first major literary work of the new computer medium, with the sixteenth century prose Novels of Chivalry and Adventure, whose propagation came to be closely tied to the then new technology of the printing press.

The innovative use of the literary technique of point of view in Adventure is then discussed. Not only is the narrator an actor in the Adventure story, the reader interacts with the narrator, so it is possible for the reader to be an active participant in the story-telling process for the first time in fixed text literature.

The most interesting findings of the study are the closed-loop quality of interactive fiction and the introspective, contemplative nature of the interactive medium. To be able to read interactive fiction, it is necessary to apply the scientific method to one's own thinking. Based on these qualities, I conclude that interactive fiction can develop into a serious artistic medium.

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INTRODUCTION

Interactive fiction can be seen as a new form of "literature"[1] in which the reader, for the first time, takes part in writing the story as (s)he reads it. Masquerading as computer games that require the reader to make simple commands or requests of the fictional story-teller as the narrative progresses, works of interactive fiction have burgeoned in numbers and quality since their birth in the mid-sixties. In this dissertation I focus on the first complex interactive story, Adventure,[2] show how it compares to other forms of literature, where it departs from the traditional text, and how it affects the reader's and author's roles.

Although Adventure and other works of interactive fiction are not printed in books, their form, story content, and effects are clearly outgrowths of the more familiar types of literature. Indeed, there are many more respects in which interactive fiction is similar to conventional literature than areas where there are differences. One of the main strengths of interactive fiction is its roots in such story-telling modes as mystery, fantasy, and adventure. In what follows, I hope to show that the interactive text is a peculiar extension of the written story form which has been prompted by the technological developments of the last two decades. This dissertation focuses on Adventure, but the points made in comparing it to traditional forms of fiction

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apply to the medium in general and are not limited to this specific work.

I have based my examination of the literary aspects of the interactive text and medium on a broad working definition of literature, one which includes the most widely-accepted elements of the many "definitions" found in dictionaries and literary criticism. The Oxford English Dictionary defines literature as "...the body of writings produced in a particular country or period, or in the world in general. Now also in a more restricted sense, applied to writing which has some claim to consideration on the ground of beauty of form or emotional effect."[3] Gero von Wilpert[4], Rene Wellek and Austin Warren[5] add to this basic definition the idea that literary works have no purpose external to themselves, and most discussions of the term emphasize the imaginative quality of literary compositions.[6] As Wellek observes: "The centre of literary art is ... the reference to a world of fiction, of imagination.[7] Roger Fowler, Karl Beckson, and Arthur Ganz view the the literary work as an artifact of the author's mind: "literature 'imitates', 'depicts', 'represents', 'presents', 'embodies' (etc.) people, objects, societies, ideas"[8]; it is "a made thing, an artefact, a single, unique, construct; a hard enduring object;"[9] literary works are "embodiments of some of man's feelings and thoughts, they are experiences shaped into aesthetic forms."[10] Beckson and Ganz list four major functions of literature: entertainment, escape into fantasy, the

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inculcation of moral and spiritual values, and gaining a better understanding of "the forces which motivate men and the place of man in society and in the universe."[11]

Adventure can be treated as literature because it is written in words, conveys stories, and can evoke powerful emotional involvement in the imaginary world it embodies. As Anthony Niesz and Norman Holland write in their article "Interactive Fiction":

> Both interactive and traditional fiction rely upon the use of written texts, or upon the elements of narration, plot, and dialogue. ... It is this reliance upon verbal utterances, upon language, upon texts in the broadest sense, which makes interactive fiction nevertheless a subspecies of literature, regardless of its mechanics of video screens, keyboards, and computer chips, regardless of the enigma it may be to literary theory.[12]

Interactive fiction is a form of narrative whose words are stored and transmitted in a different way than other types of oral or written literature. Its text is stored in the computer's memory, activated by the reader's input, and ordinarily printed on a video screen instead of on paper. Yet the method of storage and transmission of verbal information does not fundamentally transform its words into something else. The medium is verbal whether it is spoken, written, read, or heard. Words are words, independent of their method of storage and transmission -- in books, on magnetic tape, or in peoples' heads; through sight reading, touch reading (braille), or listening.

A more specific reason for analyzing the literary

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aspects of Adventure is based on what its words do: they tell stories. The Oxford English Dictionary defines a story as "A narrative of real or, more usually, fictitious events, designed for the entertainment of the hearer or reader; a series of traditional or imaginary incidents forming the matter of such a narrative."12 The stories in Adventure entertain by involving the reader in an imaginary world. Although the interactive text is organized in a computer program, the imaginary world is embodied in the text just as in any other literary work. Some of the formal elements and most of the content of the stories themselves are culturally familiar. The events depicted are not presented at random, but through the technical device of a narrator and many of the situations presented are variations of other literary stereotypes.

Interactive fiction serves the four functions of literature discussed by Beckson and Ganz. Clearly, Adventure and other works like it are meant to be read for entertainment, escape into fantasy, disinterested pleasure and emotional effect. What is perhaps not so clear is that the process of reading interactive fiction is morally grounded and can be a playful way of gaining a deeper understanding of oneself. To read interactive fiction is to practice the philosophy of science in an artificial, restricted, imaginary world. Truth is determined by observing and analyzing events, distancing oneself from one's own preconceptions, testing whether one's interpretation of the events is

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actually correct, and forming a new interpretation if it is not.

What Adventure and other works of interactive fiction lack at this time is depth of ideas and beauty of form and writing. Today, critics usually study a literary work of lesser value as a way of discussing popular culture. The literary work is not an end in itself, but as a means to understanding the cultural patterns and the society that has produced it, exploring the effects of the mass media, or elucidating good taste and high culture by comparing it to bad taste and popular culture. Adventure is a work of popular literature; however, I do not focus on it as a way of clarifying issues of popular culture. I do not seek to better understand the cultural stereotypes it expresses nor do I use it as a way of studying the computer sub-culture or current popular culture tastes.

The first part of the dissertation deals with the nature and relationship of play, games, and literature. In Chapter One, I describe Adventure as a game and examine the underlying qualities of fantasy, curiosity and challenge. Chapter Two is a general discussion of the importance of play in literature, based on Johan Huizinga's hypothesis that the play instinct is the basis of culture and aesthetic response. Here, literature is approached as a game.

The second part of the dissertation deals with Adventure as a part of the narrative tradition. In Chapter Three, the narrative structure and literary effects of

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Adventure are compared to those of the sixteenth and seventeenth century Prose Novels of Chivalry and Adventure. It is in this chapter that the question of "low literature" and "high literature" is raised; I view interactive fiction in its present stage as an immature medium capable of artistic development. In Chapter Four, I compare Adventure to mystery literature as a way of focussing on the puzzle-element of interactive fiction. A Proppian structural analysis of Adventure follows in Chapter Five.

In the third part of the dissertation, attention is turned from the ways that interactive fiction resembles conventional literature to the ways in which it differs from it. In Chapter Six, I examine the revolutionary role the narrator plays in the fluid, interactive text. In Chapter Seven, the dissertation concludes with a close look at the reader's role in the creation of the interactive text.

To facilitate critical comparison with the established genres of narrative literature, let me first emphasize what Adventure and other works of interactive fiction are not: they are not video arcade games. They do not resemble games like Donkey Kong,[13] Space Invaders,[14] or Pac-Man,[15] which require good hand-eye co-ordination and quick physical reactions. There are no flashing lights, beeps, or grinding noises. The reader enters words into the computer to communicate with the narrator and generate the story; (s)he does not press buttons to aim electronic projectiles or fire simulated weapons. To assume that a computer

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program or computer game could not have anything to do with literature would be to confuse the physical medium with the literary work itself. By such logic books would not be treated as literature because paper, ink, cloth, and glue are not literature.

I have chosen to study Adventure for several reasons. It is among the best and most complex of very early interactive fiction, thus it will be a good starting point and basis of comparison for further developments in the field. Adventure is readily available at UCSD and other universities and research centers that have the UNIX operating system. This has made it possible for me to interview many people who play Adventure, people from fields unrelated to computer science or literature in order to get reactions to it in addition to my own experiences. Its widespread availability at universities makes it a suitable choice for critical discussion of interactive fiction.

The reasons for limiting the discussion to Adventure are the following. The field of computers has been and remains dynamic; we are at the beginning of what could be an explosive development of interactive fiction. Each new advancement in computer technology makes new ways of writing interactive fiction possible; this may mean that any definition of interactive fiction will become outmoded as soon as it has been written. I believe the detailed examination of the literary aspects of one work at this time will lay the necessary groundwork for later, more complete studies of the

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interactive fiction genre as a whole.

Because interactive fiction is so different in its presentation from the linear narratives with which we are familiar, I shall use a new system for footnoting the excerpts from Adventure. In a fixed, linear text only one point, a line or a page number, is sufficient for a reference to be established, but in interactive fiction the text is neither fixed nor linear. The story plot the reader creates while playing Adventure is a result of a dynamic interaction of time, place, objects the reader carries or encounters, and the language (s)he uses. Therefore, the footnotes I use do not refer to line or page numbers from the text created by the reader, but to the line numbers from the appropriate part of the Adventure program. This program consists of several computer files, one of which, "glorkz," contains most of the text messages. I have included "glorkz" in the appendices.

A final note on terminology: games like Adventure do not yet have a generally accepted name. The term "interactive fiction" was introduced by a Florida computer company, Adventure International,[16] and points to one of the distinguishing characteristics of the game. Yet there are other types of fiction I consider interactive; for example, I view Dungeons and Dragons as a type of interactive drama. My own term for the phenomenon, "computer story games," is a designation that can also be applied to Thayer's Quest,[17] an interactive computer story game told in pictures instead of

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words. I have also used "narrative computer games," but I can imagine question-and-answer narrative games on the computer that would not fit in the category of fiction, and there are children's books which include computer programming problems as part of the story.[18] "Adventure games"[19] is the popular name because Adventure is the most widely known of them. "Adventure games" might win out in the long run, much as "Kleenex" is used instead of "facial tissue" or "Scotch tape" instead of the more descriptive "cellophane tape" (which is now made of acetate!). But while all types of "Kleenex" can be used to blow one's nose, not all "adventure games" are interactive fiction on the computer. Also, "adventure games" does not describe the specific type of story content (mystery, exploration, war setting, fantasy, etc.). "Text adventures"[20] (as opposed to video games) is a favorite in computer circles, but is inappropriate from a literary point of view. In the title of this dissertation, "Interactive Fiction: The Computer Story Game Adventure" I have incorporated as many of these terms as I possibly could, in the hope of expressing as many terminological key-words as possible for future computer bibliography searches.

Adventure is a tale much like those in the tradition of Jules Verne's Journey to the Center of the Earth,[21] as well as a treasure hunt in the mold of Robert Louis Stevenson's Treasure Island.[22] Both Adventure and Journey to the Center of the Earth take place in caves. Therefore,

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many of the descriptions of setting are similiar. Surprisingly, the cave descriptions in Adventure are often more realistic than in Verne's story: the original author, Willie Crowther, is a real life spelunker whereas Jules Verne explored only in his imagination. Neither work has any deeper meaning hidden in the story, but they can impart a tremendous sense of excitement about the wonders and mysteries of nature, the joy in exploration and finding out what lies around the next corner, and the fear of what might happen in the next tunnel. Each contains a series of obstacles set by nature which must be overcome before exploration can continue. Adventure is related to Treasure Island in two main ways. The desire for treasure motivates the stories so they are both like adolescent wish-fulfillment fantasies, and both were inspired by maps: location and physical setting dictate the process of action. Stevenson explained how he got the idea for his famous adventure story. He sometimes made colored drawings, and on one of those occasions he states:

> ...I made the map of an island; it was elaborately and (I thought) beautifully coloured; the shape of it took my fancy beyond expression; it contained harbours that pleased me like sonnets; and with the unconsciousness of the predestined, I ticketed my performance 'Treasure Island.' I am told there are people who do not care for maps, and find it hard to believe. ... as I paused upon my map of 'Treasure Island,' the future character [sic] of the book began to appear there visibly among imaginary woods; and their brown faces and bright weapons peeped out upon me from unexpected quarters as they passed to and fro, fighting and hunting treasure, on these few

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> square inches of a flat projection. The next thing I knew I had some papers before me and was writing out a list of chapters.[23]

Later, he repeated:

> ...the map was most of the plot.[24]

Adventure, too, began as a map, or rather as a computer model. In his article, "Adventures in Computing," Walt Bilofsky writes:

> Adventure was always grounded firmly in reality. Will Crowther, the original author, was a co-worker of mine at Bolt, Beranek and Newman, Inc., the Cambridge, Mass., research firm which built such projects as the ARPANET and the TENEX operating system. Will used to drive down to Kentucky monthly to join other amateur spelunkers in exploring Colossal Cave, an actual huge cavern. Topographical data was stored in BBN's computers and was used to produce maps of the cave. It's not surprising that Adventure's Colossal Cave, at least up to a point (or down to a point) is the same as the one in Kentucky, and the description and geology of the first few levels are consistent and accurate.[25]

Many elements of Adventure are similiar to those of the mystery because there are puzzles to be solved and investigations to be made; in other ways it resembles the folktale, especially in respect to structure. Therefore, two sections of the dissertation are devoted to Adventure's relationship to mystery literature and to its folktale-like structure.

The authors have drawn some of the content, characters, and motifs in Adventure from science fiction and fantasy literature, especially from Tolkien's The Lord of the

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Rings.[26] For example, in a personal letter to me, the second main author, Don Woods, wrote that he had "glanced at Tolkien's description of Orodruin"[27] in the Lord of the Rings before he wrote "Breathtaking View." In The Lord of the Rings, Orodruin, or Mount Doom, is the volcano in the Land of Mordor where the evil Sauron forged the One Ring of Power. It erupted whenever evil was on the rise again.[28] "Breathtaking View" transmits a sense of foreboding to readers, but unlike Orodruin, it does not have any special significance in the story. Here are Tolkien's depictions of this growing, fiery symbol of threat:

> Far beyond it, but almost straight ahead, across a wide lake of darkness dotted with tiny fires, there was a great burning glow; and from it rose in huge columns a swirling smoke, dusky red at the roots, black above where it merged into the billowing canopy that roofed in all the accursed land. ... Ever and anon the furnaces far below its ashen cone would grow hot and with a great surging and throbbing pour forth rivers of molten rock from chasms in its sides. Some would flow blazing towards Barad-dur down great channels; some would wind their way into the stone plain, until they cooled and lay like twisted dragon-shapes vomited from the tormented earth. Sam beheld Mount Doom, and the light of it ... now glared against the stark rock faces, so that they seemed to be drenched with blood.[29]

> Eastward Sam could see the plain of Mordor vast and dark below, and the burning mountain far away. A fresh turmoil was surging in its deep wells, and the rivers of fire blazed so fiercely that even at this distance of many miles the light of them lit the tower-top with a red glare.[30]

> The Mountain crept up ever nearer, until, if they lifted their heavy heads, it filled all their sight, looming vast before them: a huge mass of ash and slag and burned stone, out of which a sheer-sided cone was raised into the clouds.[31]

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> And then at last over the miles between there came a rumble, rising to a deafening crash and roar; the earth shook, the plain heaved and cracked, and Orodruin reeled. Fire belched from its riven summit. The skies burst into thunder seared with lightning.[32]

Compare it to Wood's "Breath-taking View":

> Far below you is an active volcano, from which great gouts of molten lava come surging out, cascading back down into the depths. The glowing rock fills the farthest reaches of the cavern with a blood-red glare, giving everything an eerie, macabre appearance. The air is filled with the flickering sparks of ash and a heavy smell of brimstone. The walls are hot to the touch, and the thundering of the volcano drowns out all other sounds. Embedded in the jagged roof far overhead are myriad twisted formations composed of pure white alabaster, which scatter the murky light into sinister apparitions upon the walls. To one side is a deep gorge, filled with a bizarre chaos of tortured rock which seems to have been crafted by the devil himself. An immense river of fire crashes out from the depths of the volcano, burns its way through the gorge, and plummets into a bottomless pit far off to your left. To the right, an immense geyser of blistering steam erupts continuously from a barren island in the center of a sulfurous lake, which bubbles ominously. The far right wall is aflame with an incandescence of its own, which lends an additional infernal splendor to the already hellish scene. A dark, foreboding passage exits to the south.[33]

Although Adventure is related to established forms of literature, reading a computer story-game is quite different from reading a regular book because the reader is also a player, making moves and performing actions, just like (s)he does in playing games. Adventure is a not a story about a character exploring a cave, it is about what happens to the reader as the reader explores the cave. In The Lord of the Rings, for example, the characters Frodo

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Baggins and Samwise have stumbled on the view of Orodruin; in Adventure it is the reader who is confronted with the volcano below.

Having the reader as protagonist is not the only innovation of computer story-games: using the computer as a narrative medium also makes it possible for the reader to interact with and take part in the story. Because the reader can make certain choices about the way the story will progress, a simplistic form of fixed-text interactive fiction is possible for the first time. By taking part in creating the story, the reader takes on some of the functions of the author. I would like to emphasize here that the reader cannot actually determine what will happen, but (s)he can choose from alternatives implicit in the story and has the illusion of control over the events. On the other hand, in comparison with the traditional book medium, there are also ways in which the reader can lose control over the literary experience. (S)he can no longer simply continue reading it, as in a printed narrative, to find out how the story turns out; in interactive fiction, the reader must actively make the story happen.

The next three examples illustrate how readers can interact with the Adventure world and create a different text each time they play, if they wish. All three people started at the same position, the beginning of the game. Yet after only six moves apiece, each came up with different results. I have abbreviated "Narrator" to "N:" and "Player"

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to "P:.

Example 1:

N: You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully.
P: West
N: You have walked up a hill, still in the forest. The road slopes back down the other side of the hill.
There is a building in the distance.
P: North
N: You're at end of road again.
P: West
N: You're at hill in road.
P: West
N: There is no way to go that direction.
You're at hill in road.
P: East
N: You're at end of road again.
P: South
N: You are in a valley in the forest beside a stream tumbling along a rocky bed.[34]

Example 2:

N: You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully.
P: Down
N: You are in a valley in the forest beside a stream tumbling along a rocky bed.
P: Up
N: You are in open forest, with a deep valley to one side.
P: Stream
N: I don't know how to apply that word here.
You're in forest.
P: Down
N: You're in valley.
P: Building
N: You're at end of road again.
P: Building
N: You are inside a building, a well house for a large spring.

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There are some keys on the ground here.
There is a shiny brass lamp nearby.
There is food here.
There is a bottle of water here.[35]

Example 3:

N: You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully.
P: Forest
N: You are in open forest, with a deep valley to one side.
P: Up
N: There is no way to go that direction. You're in forest.
P: North
N: You are in open forest near both a valley and a road.
P: Forest
N: You're in forest.
P: East
N: You are in a valley in the forest beside a stream tumbling along a rocky bed.
P: West
N: You're in forest.[36]

Recently, several series of children's books have become popular which make the reader a character who chooses the way the plot unfolds.[37] For example, The Cave of Time,[38] a book for children around age ten, contains the following instructions:

Do not read this book straight through from beginning to end! These pages contain many different adventures you can go on in the Cave of Time. From time to time as you read along, you will be asked to make a choice. Your choice may lead to success or disaster!

The adventures you take are a result of your choice. You are responsible because you choose! After you make your choice, follow the instructions to see what happens to you next.

Remember--you cannot go back! Think carefully

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> before you make a move! One mistake can be your last ... or it may lead you to fame and fortune![39]

Every book in these series contains many story units, each of which last only a few pages. At the end of a unit, either the story ends (and not always with a happy outcome for the reader-protagonist!) or the reader is given a choice and the story continues. The following example is from a story about dreaming. The "you" refers to the reader:

> "I'm glad you're here in the world of dreams come true," says the old man. "Whatever you would like to have is yours." You think for a minute of things you would like--your favorite food, having your own horse, going on a balloon ride. "You'll have to decide quickly. It's almost time for you to wake up," says the old man.
>
> If you ask the man for all the candy in the world, turn to page 12.
>
> If you ask him for a horse to ride, turn to page 20.
>
> If you ask him to take you on a balloon ride, turn to page 14.
>
> If you ask him for something you can keep after the dream is over, turn to page 23.[40]

Due to the linear nature of text printed on paper, the artistic effects of these techniques fall far short of those in interactive fiction. Turning the pages of such a book is cumbersome and time-consuming. The child is given choices about which story unit will come next, but each story unit is complete in itself. In interactive fiction the reader makes choices about each individual step and thereby constructs the story units for him- or herself. Finally, in Adventure, the choices are not pre-defined; the

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reader must interact with the narrative screen. It's a finer way of composition, as in a kaleidoscope. An interaction with a fixed text is not possible.

The narrator in Adventure and other works of interactive fiction functions as the mediator between the reader and the fictive world. The reader's interaction with the story extends to conversing with the narrator on a primitive level. To explore the cave and find the treasures, the reader must learn how to use its "hands and eyes," which, in turn, involves communicating with the narrative voice by asking it for instructions and giving it directions. The reader must learn how the author programmed the narrator to "think" (if a computer can be considered capable of thought-like processes) and what kind of language the narrator understands.

In interactive fiction, the reader's sense of story time and space is also very different from that in traditional fiction. The reader experiences the events of the story sequentially, as they are happening. There are only limited temporal lapses or omissions compared to those in conventional stories and far less skipping over locales or objects in the cave. The action takes place step by step, and the reader participates in each independent story element. This does not necessarily make for a better told story, but it does heighten the reader's sense of being a participant and prime mover in the story. Because of these aspects, most people I interviewed described it as a new

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reading experience.

In some important respects, the reader actually does gain control over spatial and temporal aspects of the action in interactive fiction. The story stops each time the reader must decide where to go next in the cave or how to overcome an obstacle or solve a puzzle. If the reader makes choices quickly, the story progresses quickly; if the reader has difficulty deciding what to do, the action slows down. How very different this is from a story in a book! For example, when I am baffled in a detective or spy story, I read faster and faster so I can find out what happened or what will happen. In contrast, when I am stumped by a puzzle in Adventure the story stops altogether until I figure out what to do. Being confronted by problems and choices in Adventure is more like facing unimportant decisions in real life than like reading about how the characters in books deal with their problems. To use a descriptive term of computer jargon, by being more of a "real-time" story, Adventure can seem like more of a real-life story. In the area of computers "real-time" means that data are gathered, processed and acted upon continuously and rapidly, rather than each step of the process being completed before the next step is carried out.[41] To apply the analogy to Adventure, then, instead of the story being laid out in its entirety for the reader as in a book, each individual move in Adventure is determined separately by the choices the reader makes. The story is composed during the process of reading.

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These innovations in a fixed text narration, i.e. the reader interacting with the narrator and acting as protagonist and writer, were made possible by advances in computer technology but inspired by the fantasy role-playing game, Dungeons and Dragons.[42] In Dicing with Dragons: An Introduction to Role-Playing Games, Ian Livingstone describes these games as a sophisticated form of make believe.[43] Each player creates a persona with differing physical and mental attributes, determined by the role of dice. Then the player assumes the role of this character and verbally acts out a story guided by the story game referee, the "Dungeon Master." The stories often take place in imaginary medieval, fantasy, or science fiction settings. In these games, each player is a character in the story, as well as the creator or author of his or her own role and dialogue.[44] The Dungeons and Dragons player acts out the story with others, and in much the same way the Adventure reader thinks out and imagines his or her role while creating the text. The idea of the reader interacting with the narrator is also an outgrowth of Dungeons and Dragons. John Butterfield, Philip Parker and David Honigmann describe the interaction between the narrator, or Dungeon Master, and the players in Dungeons and Dragons:

> "The game can be regarded as a conversation between the D.M. [the Dungeon Master] and the players, the former describing what is happening to the characters ('You are standing in a ten-foot-wide passageway; ahead is a solid oaken door with intricate

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> stone carvings round the frame...') the latter describing their actions ('All right, I'll kick the door down').[45]

Although similar verbal player-narrator interactions take place in Adventure and Dungeons and Dragons, communication with the electronic narrator in Adventure is obviously inferior to interaction with an imaginative Dungeon Master, who is capable of human dialogue.

When I first started this study, I had intended to extrapolate some of the ways literature will be produced and modified through the application of computers by examining how the printing press affected literary production. The idea that the long term development of modern western literature has been influenced by the invention of the printing press seems obvious. I was surprised to discover that this area remains unexplored. Elizabeth Eisenstein devotes the entire opening chapter of The Printing Press as an Agent of Change[46] bemoaning the lack of scholarly attention to this important field. She writes: "The effects produced by printing have aroused little controversy, not because views on the topic coincide, but because almost none have been set forth in an explicit and systematic form. Indeed those who seem to agree that momentous changes were entailed always seem to stop short of telling us just what they were."[47] Two examples she cites are Ernst R. Curtius' one line "discussion" of the topic and the no less exceptional side-stepping of the issue by Douglas McMurtrie, whose work is considered to be one of the definitive

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treatments of the topic. Curtius wrote: "The immense and revolutionary change which it [the invention of printing] brought about can be summarized in one sentence: until that time every book was a manuscript."[48] McMurtie commented: "It would require an extensive volume to set forth even in outline the far-reaching effects of this invention in every field of human enterprise."[49] Eisenstein criticizes them by writing: "In both instances we learn nothing more about seemingly momentous consequences save that they occurred. Nor is the curious reader offered any guidance as to where one might go to learn more."[50] Marshall McCluhan has pointed out many areas connected with a print-oriented culture that are in need of study, yet his jumbled and emotion-charged approach seems not to have inspired any such attempt.[51]

In its present initial stage of development, I believe interactive fiction is a type of popular literature. Abraham Kaplan defines popular literature not as "the degradation of taste but its immaturity, not the product of external social forces but produced by a dynamic intrinsic to the aesthetic experience itself."[52] He characterizes popular literature as basically formless and stereotyped, with the reader's interest focussed on the outcome instead of the unfolding of the plot.[53] As in other works of popular literature, the structure in Adventure is based on limited and well-defined formulae. The sense of novelty it arouses in readers can be traced to variations within the schemata and the complexity of the sub-plots. Characterizations are

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minimal, and the actions usually don't point to any deeper meanings. The object is to entertain.

I do not believe that the literary limitations of Adventure means that computer story games are of necessity a sub-literary genre, or that there is something about the computer medium itself which pre-destines interactive fiction always to be frivolous in nature. The development of film can be taken as an analogy. In the introduction to The Popular Arts: A Critical Reader,[54] Irving Deer and Harriet Deer describe how early film was considered an unsophisticated and unartistic medium, "so crude in its initial stages that it was considered to be beneath contempt."[55] Only with D.W. Griffith's Birth of a Nation[56] and later through Charlie Chaplin's films did audiences become aware "that the film had a capacity for communicating mature artistic experiences."[57] We can expect computer technology to continue undergoing rapid growth and this, in turn, will provide the technical basis for a sophistication and maturation of interactive fiction. In addition to growth in the computer technology itself, we can also project a "democratization of computer use" which might be analagous to the "democratization of reading"[58] that characterized the spread of printing. We can suppose that with more people reading interactive fiction, there will be a concomitant upsurge in both the number and quality of computer story games created.

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FOOTNOTES: INTRODUCTION

1. A discussion of the term "literature" follows shortly. See footnote no. 3.

2. Willie Crowther and Don Woods, Adventure, UNIX Version, ll. 1316-1319. (See Appendices for references to Adventure by line number.)

3. The Oxford English Dictionary: Being a Corrected Re-Issue with an Introduction, Supplement, and Bibliography of New English Dictionary on Historical Principles founded Mainly on the Materials Collected by the Philological Society, Vol. VI (Oxford: Clarendon Press, 1961), p. 342.

4. Gero von Wilpert, Sachwörterbuch der Literatur (Stuttgart: Alfred Kröner Verlag, 1979), p. 463.

5. René Wellek and Austin Warren, Theory of Literature (New York: Harcourt, Brace & World, Inc., 1956), p. 27.

6. Roger Fowler, Ed. A Dictionary of Modern Critical Terms (London and Boston: Routledge and Kegan Paul, 1973), pp. 105-107.

7. Wellek and Warren, Theory of Literature, p. 25.

8. Fowler, A Dictionary of Modern Critical Terms, p. 106.

9. Fowler, A Dictionary of Modern Critical Terms, p. 107.

10. Karl Beckson and Arthur Ganz, Literary Terms: A Dictionary. (New York: Farrar, Straus and Giroux, 1975), p. 131.

11. Beckson and Ganz, Literary Terms, p. 132.

12. Anthony J. Niesz and Norman N. Holland, "Interactive Fiction" in: Critical Inquiry, Vol. 2, No. 1, p. 125.

13. The Oxford English Dictionary, p. 1041.

14. Donkey Kong, (Nintendo).

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15. Space Invaders, (Sego).

16. PacMan, (Bally Co.).

17. Bob Liddil, "Interactive Fiction: Six Micro Stories," in an issue devoted to artificial intelligence in: Byte, Vol. 6., No. 9 (1981), p. 436.

18. Rick Dyer, Thayer's Quest (Carlsbad, California: RDI Video Systems). For a description of the game, see Matt Damsker, "Newest Game in Town--Thayer's Quest," Los Angeles Times, July 7, 1984.

19. See, for example: Floyd McCoy and Lois McCoy, The Bytes Brothers: Program a Problem, A Solve It Yourself Computer Mystery (Toronto, New York, London, Sydney: Bantam Books, 1984).

20. David Thompson, "The Cottage Computerist: Writing Games is an Adventure," Profiles: The Magazine for Kaypro Users, Vol. 2, No. 1 (1984), pp. 14-15, 19.

21. Thomas Enright, "Choose Your Quest," Profiles: The Magazine for Kaypro Users, Vol. 2, No. 1 (1984), pp. 30-31, 34-37, 42-43.

22. Jules Verne, A Journey to the Center of the Earth, in: Works of Jules Verne, ed., Claire Booss (New York: Avenel Books, 1983), pp. 217-390.

23. Robert Louis Stevenson, Treasure Island (London, New York, Toronto: Oxford University Press, 1955).

24. Steveson., Treasure Island,, pp. xiv-xv.

25. Stevenson, Treasure Island, p. xxi.

26. Walt Bilofsky, "Adventures in Computing," Profiles: The Magazine for Kaypro Users, Vol. 2, No. 1 (1984), p. 25.

27. J.R.R. Tolkien, The Lord of the Rings (New York: Ballantine Books, 1954).

28. Personal computer mail communication from Don Woods, March 21, 1984.

29. Robert Foster, The Complete Guide to Middle-Earth: From 'The Hobbit' to 'The Silmarillion' (New York: Ballantine Books, 1974), pp. 397-398.

30. Tolkien, The Lord of the Rings, p. 214.

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31. Tolkien, The Lord of the Rings, p. 221.

32. Tolkien, The Lord of the Rings, p. 267.

33. Tolkien, The Lord of the Rings, p. 276.

34. Adventure, ll. 261-279.

35. Adventure, ll. 1-3; 4-5; 303; 304; 1337, 304; 303; 7-8.

36. Adventure, ll. 1-3; 7-8; 9; 1341, 307; 306; 303; 6; 1166, 1168, 1209, 1211.

37. Adventure, ll. 1-3; 9; 1337, 307; 10; 307; 7; 307.

38. This list of such series is not complete, but it should give some idea of the genre's widespread popularity.

A What-Do-I-Do-Now Book (New York: An Infocom Book, Tom Doherty Associates, 1983).

An Endless Quest (Lake Geneva, Wisconsin: TSR Hobbies Inc., 1982).

Choose a Pathway to the Magic Realms (Bergenfield, New Jersey: New American Library, 1984).

Choose Your Own Adventure: You're the Star of the Story! (Toronto, New York, London, Sydney: Bantam, 1979).

Dragontales (Bergenfield, New Jersey: New American Library, 1984).

Magicquest (New York: Tempo Books, 1976).

Pick a Path to Adventure, Fantasy Forest (Lake Geneva, Wisconsin: TSR Hobbies Inc., 1983).

Plot Your Own Horror Stories (New York: Simon and Schuster Wanderer Books, 1982).

Sorcery! (New York: Penguin Books, 1983).

The Star Challenge Series, A Yearling Book (New York: Dell Publishers).

The Time Machine Series (Toronto, New York, London, Sydny: A Byron Press Book, Bantam, 1984).

Which Way Books (New York: Pocket Books, Simon and

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Schuster, 1982).

28. Edward Packard, The Cave of Time (Toronto, New York, London, and Sydney: Bantam Books, 1979).

39. Packard, The Cave of Time, p. 1.

40. Edward Packard, Dream Trips (Toronto, New York, London, and Syndey: Bantam Skylark), p. 7.

41. Rose Deakin, Understanding Micro-Computers: An Introduction to the New Personal Computers for Home and Office (Bergenfield, New Jersey: New American Library, 1982), pp. 36-37, 98, 176.

42. Personal computer mail communication from Don Woods, March 21, 1984. The reference to the game itself is: Gary Gygax, Dungeons and Dragons (Lake Geneva, Wisconsin: TSR Hobbies Inc., 1974).

43. Ian Livingstone, Dicing with Dragons: An Introduction to Role-Playing Games (New York and Scarborough, Ontario: New American Library, 1982).

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45. John Butterfield, Philip Parker, and David Hongimann, What is Dungeons and Dragons? (New York: Warner Books, 1982), p. 2.

46. Elisabeth Eisenstein, "The unacknowledged revolution," in: Elisabeth Eisenstein, The Printing Press as an Agent of Change: Communications and Cultural Transformations in Early-Modern Europe (Cambridge, London, New Rochelle, Melbourne, Sydney: Cambridge University Press, 1980), pp. 3-42.

47. Eisenstein, The Printing Press as an Agent of Change, pp. 6-7.

48. Ernst R. Curtius, European Literature and the Latin Middle Ages, tranl. by Williard Trask (New York: Pantheon Books, Bollingen Series, 1953), p. 238.

49. Douglas McMurtie, The Book (Oxford, New York, and London: Oxford University Press, 1943), p. 136.

50. Eisenstein, The Print Press as an Agent of

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Change, p. 7.

51. Marshall McCluhan, The Gutenberg Galaxy: the Making of Typographic Man (Toronto: University of Toronto Press, 1962); and Understanding Media: the Extensions of Man (New York: New American Library, 1964).

52. Abraham Kaplan, "The Aesthetics of the Popular Arts," in: Harriet Deer and Irving Deer, The Popular Arts: A Critical Reader (New York: Charles Scribner's Sons, 1967), p. 319.

53. Harriet Deer and Irving Deer, The Popular Arts: A Critical Reader (New York: Charles Scribner's Sons, 1967), pp. 319-323.

54. Deer and Deer, The Popular Arts: A Critical Reader, pp. 1-20.

55. Deer and Deer, The Popular Arts: A Critical Reader, p. 9.

56. D.W. Griffith, The Birth of a Nation, from Thomas Dixon's novel, The Clansman, Epoch.

57. Deer and Deer, The Popular Arts: A Critical Reader, p. 13.

58. Eisenstein discusses the effects of the printing press on literacy throughout her book, The Printing Press as an Agent of Change.

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ADVENTURE AS A GAME

In "What Makes Things Fun",[1] Thomas Malone, a psychologist, postulates and then examines qualities that make computer games so fascinating to many people. According to him, the most popular games share several characteristics: they have very clear goals of variable levels of difficulty, there are different types of goals, and they can simultaneously appeal to different types of fantasies. Malone found that among young children word games, such as Adventure, were among the least popular games, while games involving projectiles, destruction, flashing lights and sound were the most popular. Yet Adventure, like chess, appeals to adults more than children, and if UCSD is any indication, the adults to whom it appeal are educated, well-read people.

One reason Adventure can appeal to sophisticated people is that it is a relatively complicated game, though not nearly as complex as chess. Solving the problems presented in it demands situational analysis, deductive thinking, and concentration. Several levels of rules must be discovered and figured out in order to play. One of the fascinating aspects of Adventure is that the reader must figure out how the game and narrative works, i.e.:

1. how to communicate with the computer/narrator

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2. how to make moves
3. where the cave is in the first place
4. where one is in the cave
5. where and what the treasures are
6. how to overcome obstacles
7. how to obtain the tools necessary to get the treasures
8. and how to get the treasures back to the surface once they have been won.

During this entire process, the player must also fend off attacks and keep track of supplies needed to explore the cave, such as food, water, and light. There are indeed various and variable levels of difficulty: the player must move through the cave as expediently as possible, which means finding, collecting, and safely depositing treasures in few moves. Score is kept in a ratio of number of points earned per number of moves, and each skill level is awarded a certain name. At the end of the game the reader is given the points earned and resulting ranking in one of the following messages:

```
You are obviously a rank amateur. Better luck next time.
Your score qualifies you as a novice class adventurer.
You have achieved the rating: "experienced adventurer".
You may now consider yourself a "seasoned adventurer".
You have reached "junior master" status.
Your score puts you in master adventurer class c.
Your score puts you in master adventurer class b.
Your score puts you in master adventurer class a.
All of adventuredom gives tribute to you,
```

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adventurer grandmaster![2]

What makes Adventure different from most other computer games, though, is that it is narrative, that the reader uses words to make the action progress, and that it involves complicated fantasies which the reader/player helps to generate. Adventure is a "literary game."

In its present form, Adventure is at the level of popular forms of literature. Like many mystery novels or best-sellers, or TV programs or romance novels, it is written for a specific audience and its main purpose is entertainment. Most popular literature is not interesting enough to be read more than once because it lacks multiple levels of meaning and relies on structures already known to and expected by its readers. Adventure is much the same. Once a reader/player has successfully moved through the cave, explored its hidden recesses and captured its treasures, its novelty wears off and it has little more to offer as a work of fiction.

One of the things Adventure can give its readers, though, is the fantasy world a reader can create in response to the narrative material. Adventure is a delightful game partly because it can help its players to imagine themselves in a world very different from their own. As the instructions state: "Magic is said to work in the Cave."[3] Players seek out this imaginary underground world to envelope themselves in mystery, adventure, and excitement. It is therefore a very different kind of computer game from the usual

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shoot-'em-up, destroy-the-alien-spaceship video arcade variety. Although the object of Adventure is to win the medium is verbal, not visual, and perhaps even more important, most of the fun of playing comes from the elaborate fantasies the game can arouse.

In Adventure, the game is embedded in a story. The player must find and explore a cave that is "somewhere nearby."[4] As mentioned, Adventure is competitive and the object of the game is to accumulate points. To do this, one must find the treasures in the cave, each of which has a certain number of points attached to it, figure out how to get the treasure into one's possession, and then how to bring it back and deposit it in the building on the surface. The scoring system is quite complicated and takes into account not only how many treasures the player has acquired, but also how the reader goes about locating them, exploring the cave, and even getting into the cave in the first place. Points are deducted for quitting, dying, or being killed. Some puzzles are more difficult than others to solve, and the player is given more points for their solution.

All this is more difficult than it sounds, because one of the quirks of Adventure is that players must figure out the rules of the game for themselves. Players are given only the barest information on how they can communicate with the computer-narrator, how they can move, and the whereabouts of the cave. Furthermore, once the player is in the cave, figuring out how to survive, overcome obstacles,

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and obtain the treasures can be quite challenging, for the laws of nature do not always apply in this fantasy setting; the cave is a subterranean world of magic.

In case any readers of this dissertation have not played Adventure or similiar computer games, I would like to present some examples from game texts to illustrate how it is played. When the player begins the game, the welcoming message appears on the video terminal screen and the reader is asked if (s)he would like instructions. If the player types "yes," the computer displays the following text:

> Somewhere nearby is Colossal Cave, where others have found fortunes in treasure and gold, though it is rumored that some who entered are never seen again. Magic is said to work in the cave. I will be your eyes and hands. Direct me with commands of 1 or 2 words. I should warn you that I look at only the first five letters of each word, so you'll have to enter "northeast" as "ne" to distinguish it from "north". (Should you get stuck, type "help" for some general hints. For information on how to end your adventure, etc., type "info".)[5]

Then the game begins. The player is given this message:

> You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully.[6]

Although many first-time players type "help" and get more instructions, others are brave and try to play immediately without them. One of the first difficulties they encounter is trying to even talk to the narrator. Here is the script of such an opening attempt.

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N: Welcome to adventure!! Would you like instructions?
P: No
N: You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully.
P: Go to the building
N: I don't know that word.
P: Walk toward the building
N: I don't know that word.
P: Go in the building
N: You are inside a building, a well house for a large spring.

There are some keys on the ground here.
There is a shiny brass lamp nearby.
There is food here.
There is a bottle of water here.
P: Pick up the keys
N: I don't know that word.
P: Take the keys
N: I don't know that word.
P: Carry the keys
N: I don't know that word.
P: Why not
N: I don't know that word.
P: Walk outside
N: You're at end of road again.
P: Walk west
N: You have walked up a hill, still in the forest. The road slopes back down the other side of the hill.
There is a building in the distance.
P: Walk east
N: You're at end of road again.
P: Walk east

[...later, after the reader has gotten lost and evidently frustrated]
P: Go away!
N: I don't know that word.
P: Get lost!
N: I'm as confused as you are.
P: Help me[7]
[At this request, the help message appears]

Obviously the narrator recognizes only a terse language of its own, and the player must learn to speak it if anything is to happen. Either players figures

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this out themselves (and many do), or they can find out by typing "help." The result is this message:

> I know of places, actions, and things. Most of my vocabulary describes places and is used to move you there. To move, try words like forest, building, downstream, enter, east, west, north, south, up, or down. I know about a few special objects, like a black rod hidden in the cave. These objects can be manipulated using some of the action words that I know. Usually you will need to give both the object and actions words (in either order), but sometimes I can infer the object from the verb alone. Some objects also imply verbs; in particular, "inventory" implies "take inventory", which causes me to give you a list of what you're carrying. The objects have side effects; for instance, the rod scares the bird. Usually people having trouble moving just need to try a few more words. Usually people trying unsuccessfully to manipulate an object are attempting something beyond their (or my!) capabilities and should try a completely different tack. ...[8]

To show how the game can be played, I include a longer excerpt of a game text:

N: You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully.
P: Enter building
N: You are inside a building, a well house for a large spring.

There are some keys on the ground here.
There is a shiny brass lamp nearby.
There is food here.
There is a bottle of water here.
P: Take lamp
N: OK
P: Carry food
N: OK
P: Take keys
N: OK
P: Take water
N: OK

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P: Downstream
N: The stream flows out through a pair of 1 foot diameter sewer pipes. It would be advisable to use the exit.
You're inside building.
P: Exit
N: You're at end of road again.
P: Go downstream
N: At your feet all the water of the stream splashes into a 2- inch slit in the rock. Downstream the streambed is bare rock.
P: Rock
N: You are in a 20-foot depression floored with bare dirt. Set in the dirt is a strong steel grate mounted in concrete. A dry streambed leads into the depression.
The grate is locked.
P: Unlock
N: The grate is now unlocked.
P: In
N: You are in a small chamber beneath a 3x3 steel grate to the surface. A low crawl over cobbles leads inward to the west.[9]

(The player is now in the cave.)

I hope this example reveals how complicated playing Adventure can be. It is a brain-teaser in many different ways. Figuring out how to play is a little like being exposed to a new culture where language is used in an unaccustomed way; one actually speaks to a computer program. To even move through the cave is a challenge since Colossal Cave is like a real cave--one must always remember how to retrace one's path or face figurative death. Orientation is so difficult that many players make maps for themselves. The puzzles are always challenging, sometimes whimsical, sometimes funny. Solving the problems not only demands logical analysis, but must also be based on the players' knowledge of the nature of things, some of which don't even exist in the real world, such as dragons and trolls. Still,

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perhaps the most captivating and distinguishing aspect of Adventure is not the complexity of its rules and scoring system, but the elaborate fantasy in which the puzzles, and rules, and challenges are masked.

We live in a time in which two of the most popular forms of entertainment require only a passive participation by the audience. Television and film provide images for their viewers. As Jerry Mander puts it, "You have opened your mind, and someone else's daydreams have entered."[10] Playing computer games and reading books take a great deal of personal effort--one must think and imagine for oneself. Why should people enjoy something at which they have to work so hard?

Sigmund Freud believed that people needed to fantasize and daydream as a way of fulfilling conscious and unconscious wishes.[11] Both Sigmund Freud and Anna Freud understood games as an attempt to relive passively experienced traumatic events in an active, controlling role.[12] White believes that there is an important drive involved in motivation besides the reduction of primary needs, a drive he calls "effectance."[13] It is the desire for competence and feeling effective in dealing with the surrounding environment. The pleasure one gains from exploring, manipulating objects, and developing one's skills can be explained by this human need for personal accomplishments. Curiosity, which depends on novelty, complexity, surprisingness, and incongruity, may be another driving force in our

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personalities and has been studied extensively by Berlyne.[14] It appears that challenge, fantasy, and curiosity can be more powerful motivators than laziness.

Thomas Malone explores the concepts of challenge, fantasy, and curiosity to explain why computer games are so much fun, or as he puts it, so intrinsically motivating.[15] In order for something to be challenging, "it must provide goals whose attainment is uncertain."[16] The ultimate goal in Adventure is to acquire enough points to become a wizard. In general, there are several ways discussed by Malone that achieving a goal can be made uncertain, 1. variable difficulty level 2. multiple level goals 3. hidden information 4. randomness.[17] Adventure makes use of them all. 1. The puzzles become progressively more difficult. For example, one of the first problems the player faces inside the cave is capturing a bird in order to drive away a "fierce snake" barring the player's way.[18] If the player commands "catch bird," the bird is frightened and flies away. Although it is difficult for the reader to imagine how not to frighten the bird, there is a hint in the help message.[19] Later in the game, there will be no hints. 2. There are multiple level goals; as I have stated elsewhere, one can achieve various rankings. 3. Each one of the puzzles is based on hidden information. In the case of the bird, for example, the hidden information is that the bird is afraid of the black rod. To catch the bird, one must first drop the black rod.[20] 4. In Adventure, the pirate and the dwarves appear at

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unexpected times. They provide the randomness factor.

There are two more concepts to be discussed in the area of challenge and uncertain outcome: game strategy and self-esteem. McKinsey studied mathematical game theory and stated, "...after optimal strategies of a game are known, it ceases to offer any intellectual challenge, and most people stop playing it."[21] There is a known optimal strategy for playing Tic Tac Toe; for chess there is not. Although Adventure is not nearly as complex as chess, each puzzle is different, and some strategies that are successful in solving one puzzle are unsuccessful in another.

The reason challenges and goals hold our attention is because they can give us feelings of success -- they engage our self esteem.[22] One of the things that can make playing Adventure so delightful is the feeling of achievement that comes from just moving through the cave and exploring new parts of it. It is the same type of pleasure that motivates hikers, campers, bicyclists, and other adventurers--mastering the surrounding environment.

Malone's second major category in determining what makes things fun is curiosity.[23] Based on work by Piaget and Berlyne, he defines curiosity as an "optimal level of informational complexity,"[24] which means that an enjoyable problem should be novel and complex but not incomprehensible. Challenge and curiosity are related: "Not only are the two concepts parallel, but in a way, either concept could subsume the other. Challenge could be explained as

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curiosity about one's own ability. Curiosity could be explained as a challenge to one's understanding."[25]

There are important differences, though. Challenge engages self-esteem, while curiosity does not. Also, curiosity appears to have a physical, sensory basis in humans. Malone believes that cognitive curiosity is aroused when a person's knowledge structures are incomplete, inconsistent, and parsimonious.[26]

Wanting to know "who done it" in a mystery novel is a good example of the "cognitive motivation to bring completeness to your knowledge structure."[27] Adventure is structured around mini-mysteries and puzzles for which the reader must provide the solution. Many readers spend hours and hours both at the computer terminals and away from them trying to "complete their knowledge structures." They try to figure out the answers to the compelling problems they face in the story: "What will I find if I go down the steps into the pit? How can I get the dragon off the precious Persian carpet? How can I find my way back to the surface if my light is dimming and will soon go out?"

Another way that Adventure arouses interest and curiosity is expressed in the idea of magic. The normal laws of nature do not necessarily govern the world of the cave; the reader has to find out what rules do apply, i.e. make his or her cognitive structures more consistent. There are chambers in the cave, for instance, where one need only say the magic words (if one has figured them out!) to be

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transported instantaneously back to the building on the surface.[28] The idea that there could be a withered little beanstalk murmuring "water, water"[29] is inconsistent with our knowledge of the real world, but consistent with what we know from fairy tales.[30]

Malone writes, "One way of stimulating curiosity by appealing to parsimony is to give a number of examples of a general rule before showing how (or letting students discover that) all the examples can be explained by the single new rule."[31] Especially at the beginning of the game, trying to form an Adventure world view, trying to figure out Adventure's laws of nature is appealing and compelling. Another example of the type of general law the reader can discover is that every object found in the cave has some purpose, if not at the moment then later. One general rule, then, can be formulated like this: If you find something new in the cave, take it with you. If you've got too much to carry, take inventory, drop something unimportant and take the new object. You'll probably need it soon.

Adventure is a very captivating story -- it arouses a curiosity that the reader knows can be satisfied. It combines curiosity and challenge, for it provides repeated and varied opportunities to challenge one's understanding and raise one's sense of self-esteem. Challenge and curiosity are the two defining qualities of computer games in general, and Adventure shares these qualities with them. Yet there are several things that separate Adventure from what can be

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considered the average computer game. Sensory curiosity is not aroused directly with noises, flashing lights, or other visual effects. Because it is conveyed in words, each reader or player must imagine the story without any props. Fantasy is the main element that distinguishes interactive computer fiction from other video games, and along with the verbal medium, the main element through which it is related to literature. There are other games, such as Rogue,[32] with themes from sci-fi, fantasy, and sword and sorcery literature; what distinguishes Adventure from them is the medium -- words -- which promotes imagery and action-oriented imagination.

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FOOTNOTES: ADVENTURE AS A GAME

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4. Adventure, l. 1316.

5. Adventure, ll. 1316-1323.

6. Adventure, ll. 1-3.

7. Adventure, ll. 1430; 1-3; 1418; 1418; 6; 1166, 1168, 1209, 1211; 1418; 1418; 1418; 141 303; 4-5; 303; 1418; 1434.

8. Adventure, ll. 1-3; 6; 1166, 1168, 1209, 1211; 1409; 1409; 1409; 1409; 145; 305; 303; 11-12; 13-15; 1171; 1371; 16-17.

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16. Malone, What Makes Things Fun to Learn, p. 50.

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19. Adventure, ll. 1387-1405.

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21. J.C.C. McKinsey, Introduction to the Theory of Games, New York: McGraw-Hill, 1952. From: Malone, What Makes Things Fun to Learn, p. 52.

22. Malone, What Makes Things Fun to Learn, p. 56.

23. Malone, What Makes Things Fun to Learn, pp. 60-63.

24. Piaget and Berlyne in: Malone, What Makes Things Fun to Learn, p. 60.

25. Malone, What Makes Things Fun to Learn, p. 61.

26. Malone, What Makes Things Fun to Learn, pp. 60-63.

27. Malone, What Makes Things Fun to Learn, p. 62.

28. Adventure, ll. 21-23; 60-62.

29. Adventure, l. 1219.

30. Specifically, the well-known fairy tale, "Jack and the Beanstalk."

31. Malone, What Makes Things Fun to Learn, p. 63.

32. Michael C. Toy, Kenneth C.R.C. Arnold, and Glenn Wichman, Rogue. The following description of the game is from the UNIX Programmer's Manual, listed under ROGUE(6):

Rogue is a computer fantasy game with a new twist. It is crt oriented and the object of the game is to survive the

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attacks of various monsters and get a lot of gold, rather than the puzzle solving orientation of most computer fantasy games.

To win the game (as opposed to merely playing to beat other people high scores) you must locate the Amulet of Yendor which is somewhere below the 20th level of the dungeon and get it out. Nobody has achieved this yet and if somebody does, they will probably go down in history as a hero among heros.

When the game ends, either by your death, when you quit, or if you (by some miracle) manage to win, rogue will give you a list of the top-ten scorers. The scoring is based entirely upon how much gold you get. There is a 10% penalty for getting yourself killed.

ROGUE, The UNIX Programmer's Manual (6), 4.2 Berkeley Software Distribution, 1983.

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GAMES AND LITERATURE

There are African cultures in which no differentiation is made between instrumental or vocal music and dance: they are all simply considered music.[1] For the ancient Greeks, music "...not only embraced singing and dancing to instrumental accompaniment but covered all the arts, artistries, and skills presided over by Apollo and the Muses."[2] In western culture we tend to view each aspect as a separate, independent artistic medium. But we also have many examples of art forms that are fusions of two or more other modes of expression. Songs are melody and words; opera is orchestral music combined with vocal music, mime, paintings, architecture, literary texts, and sometimes dance. Some types of "pure" literature are combinations of several modes: drama texts can be performed on stage, but also be read as literature; poetry is related to music through rhythm and sounds, as demonstrated by the German musical Kunstlied sub-genre, and medieval lyrics and heroic epics were intended to be sung.

Analogously, Adventure is both a computer game and a work that can be read. There should be nothing foreign about this idea: embedding games in stories and stories in games is quite common. In the next section, I include a few examples of game-story hybrids that are familiar to us.

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The Riddle as a Game and in Literature

In order to make logic problems more fun to solve, many of them are not expressed in mathematical symbols, but camouflaged as stories. The following well-known example illustrates in a simplistic way how the information which is needed to solve a logical problem can be presented within the framework of a scene or story.

> A man was looking at a portrait. Someone asked him, "Whose picture are you looking at?" He replied: "Brothers and sisters have I none, but this man's father is my father's son." Whose picture was the man looking at?[3]

This is a very simple example of a logic riddle, but in some the surrounding fantasy elements attain the length and complexity of short stories. Logical relationships, processes, and dynamics are represented in descriptions of human relationships, social interactions, and events. Especially in the longer stories, the situations seem to be chosen not only because they express the logical relationships so well, but because we can interpret them as moral or aesthetic problems. This places them within a context that can be more than just puzzle-solving; solving them becomes personally meaningful and important. Often the stories are imitations of literary genres or characters that are already familiar to the reader. A story might have the same structure and motifs of a fairy tale, for example, or be built around a quest for treasure or wisdom, or involve beloved fictional characters like Dracula or Sherlock Holmes.

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One of the most common devices is to disguise the logic problems as mysteries. George Summers introduces his book, New Puzzles in Logical Deductions, in the following fashion:

> The puzzles in this book have been composed to resemble short "whodone it" mysteries. Each puzzle contains a number of clues, and it is up to the reader, or "detective," to determine from these clues which of various solutions is correct. ... In some of the puzzles an actual criminal must be sought, but the greater part of them concern more-or-less innocent people. ...[4]

In most of the stories the reader can identify with characters' wishes or needs. Since their goals make sense to us, there is a reason, a motivation for solving the problems, i.e. we fulfill our own needs vicariously by fulfilling the characters' needs. Often the problems are couched in a primitive psychology of reward and punishment: if the heroes answer the questions correctly they win something valuable, and if not, they die. There are stories about kings and princesses, fictional characters like Alice in Wonderland, Sherlock Holmes, Tweedledum and Tweedledee, logic anecdotes about real people (von Neumann and Einstein are two favorites), and complicated stories about beings who can possess either one set of characteristics or a completely different set and must somehow be differentiated. Werewolves, zombies and the insane are common characters for logical stories of this nature. The next example consists of two excerpts from "Is Dracula Still Alive," and have been chosen to show the

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two main poles of presentation in logic problem stories. In the first part, the information aspect is emphasized, in the second the artistic or fantasy element. The narrator of the story wants to find out whether Count Dracula is still alive, in which case he wants to meet him, or if he has been destroyed to see his actual remains.

> Part 1:
>
> At the time I was in Transylvania, about half the inhabitants were human and half were vampires. The humans and vampires are indistinguishable in their outward appearance, but the humans (at least in Transylvania) always tell the truth and the vampires always lie. What enormously complicates the situation is that half the inhabitants of Transylvania are totally insane and completely deluded in their beliefs--all true propositions they believe to be false and all false propositions they believe to be true. The other half are completely sane and know which propositions are true and which ones false....[5]

In this part of the story, the author is concerned with conveying information, not with embellishing the artistic or fantasy effects. The tale continues, and the intentions of the author shift from presenting the logic problem to telling an interesting story. Supposedly, after talking with inhabitants and several unsettling experiences, the narrator finds his way to Dracula's Castle and finds that the Count is indeed alive and has "requested" an audience with his guest.

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Part 2:

> "Are you aware that I always give my victims some chance of escape?" No," I honestly replied, "I was not aware of this." "Oh, indeed," replied Dracula, "I would not think of depriving myself of this great pleasure." Somehow or other, I did not quite like the tone of voice in which he said this; it savored of the supercilious. "You see," continued Dracula, "I ask my victim a riddle. If he correctly guesses the answer within a quarter of an hour, I set him free. If he fails to guess, or if he guesses falsely, I strike, and he becomes a vampire forever."[6]

In summary, the authors of logic problems make use of literary devices to breath life and interest into their games. They disguise the problems as little stories and induce the reader to believe there is a reason for solving the problems other than to simply solve logic problems.

Riddles appear to be one of the oldest types of literature.[7] André Jolles classifies them among his nine "simple forms" of literature and describes them as an examination or a competition between questioner and answerer.[8] Many folktales contain or are constructed around riddles; there are several riddle-tales in Grimm's collection.[9] In folktales such as "The Devil with the three Golden Hairs"[10] the riddle takes the form of difficult questions to which the hero must find the answers. Often the enemy is tricked out of knowledge. There are several "riddles" like this in the Old Testament, such as when the Queen of Sheeba tests Solomon's wisdom by asking him to distinguish between real flowers and the exquisite imitation flowers she has had made, and he opens a window to let a bee into the room. In

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other stories, though, a true riddle serves as a test of the hero or heroine. In the story of Turandot in the collection "1001 Nights," for example, Prince Kalaf wins the hand of the princess when he can solve the riddle she poses him.[11] Huizinga, who traces the history of competitions in knowledge, focuses especially on the sacred function of the poetic riddle.[12] He views the riddle as a "ritual element the highest importance," as a literary form, and yet "essentially a game,"[13] a view shared by Richard Beitl.[14] The spirit of competition in wisdom or knowledge expressed in the literary motif of the capitol riddle, in which the player's life is at stake, is present in Hindu tales (for example, the story of King Yanaka holding a theological riddle-solving contest among the Brahmins with a cow for a prize), in Greek literature, (the riddle posed by the Sphinx, for example), as well as in the German tradition of the Halsraetsel.[15] Huizinga believes that mystic and esoteric philosophy are outgrowths of these "games,"[16] and that one of the literary derivitives of the riddle is the philosophical or theological interrogative discourse.[17]

Words as Games

One of the first possible hybrids of literature and games to come to mind are word games. Many types of games besides crossword puzzles use words as their building material -- anagrams, antigrams, palindromes, chain verses, saws, word surgeries, pangrammatics, transpositions, letter

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patterns, geometric forms, numerical logology, which Howard Bergerson refers to collectively as "literary chess."[18] Studying literature promotes or is partly based on a fascination with language and words. For most people a passion with words is actually a love of the ideas that find their expression in language. Not so, however, with the true logophile. They love words not for the meanings they express, but for the words themselves: for their structure or sound or for the games that can be played with them. For logophiles, words are beautiful in and of themselves and are objects of art, to be "examined and evaluated, admired or criticized, accepted or rejected."[19] Willard Espy expresses this unusual relationship like this: "...I do not treat them (words) as equals, but as pets, to be striked or kicked according to their desert and my whim."[20] Borgmann considers words to be "objects of beauty in the world of language."[21] For both, words like "subbookkeeper," "stressed," and "triennially" are "shining paragons of the loveliness of language."[22]

Games in Literature

Although language is the artistic medium for both recreational linguistics and literature, language is used in literature as a means of artistic expression; in recreational linguistics it is not. It is not surprising, however, that many poets are logophiles, and that their literature is in great part and expression of their loveplay with words.

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In Play in Poetry,[23] Louis Untermeyer has collected various poetic expressions of a playful impulse with words. One of his main points is that playfulness and seriousness are not exclusive, a belief held even more strongly by Huizinga, who states: "Play is a thing by itself. The play-concept as such is of a higher order than is seriousness. For seriousness seeks to exclude play, whereas play can very well include seriousness."[24] Even as ernest an artist as Goethe paradoxically characterized his tragedy Faust as "these very serious jokes" ("diese sehr ernsten Scherze")[25] and believed that true art is based on an inner connection between seriousness and play ("Nur aus innig verbundenem Ernst und Spiel kann wahre Kunst entspringen.")[26]

To support the thesis that word games can be used seriously, many of Untermeyer's illustrations of the games to be found in literature are taken from very serious poetry. In a section on the games in religious poetry, for example, I found a poem by John Donne that I recognized as a song of meditation used in some protestant churches today:

> Batter my heart, three-personed God; for you
> As yet but knock, breathe, shine, and seek to mend.
> That I may rise and stand, o'erthrow me and bend
> Your force, to break, blow, burn, and make me new.[27]

The entire poem is a series of strange, witty paradoxes which culminates in the idea of the speaker begging God to rape him as a means of purification and unification with

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God:

> Yet dearly I love you, and would be loved fain,
> But am betrothed unto your enemy:
> Divorce me, untie, or break that knot again,
> Take me to you, imprison me, for I
> Except you enthral me, never shall be free,
> Nor ever chaste, except you ravish me.[28]

Untermeyer gives other examples of word games in serious poems: puns, anagrams, acrostics, and poems in which the first letter of each succeeding final rhyming word is dropped. He believes the spirit of play to be especially strong in Emily Dickenson's poetry, where "the mingling of rapture and irreverence ... makes death a plaything and God a playfellow.[29] Here is one of her most curious playful-religious poems:

> Papa above!
> Regard a Mouse
> O'erpowered by the Cat;
> Reserve within thy Kingdom
> A "mansion" for the Rat!

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Snug in seraphic Cupboards
To nibble all the day,
While unsuspecting Cycles
Wheel solemnly away![30]

And a lighthearted poem about death,

Because I could not stop for Death,
He kindly stopped for me;
The carriage held but just ourselves
And Immortality ...[31]

in which "Death becomes a genteel suitor ... a stiffish New England gentleman taking his lady for an afternoon drive into the country."[32]

Eugen Gomringer is a modern poet/logophile who emphasizes the game aspects of his poetry. He describes new poetry as:

> ... object of thought in a play of ideas... it will serve man through its objective play elements, as the poet will serve man through his special knack for just this kind of play: for the poet is an expert in the principles of play & language, the inventor of their future formulations.[33]

and then playfully defines it and un-defines it in a poem:

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words are shadows
shadows become words

words are games
games become words

are shadows words
do words become games

are games words
do words become shadows

are words shadows
do games become words

are words games
do shadows become words[34]

Gomringer makes use of palindromes, anagrams, permutations, and other word games. The following poem is one of his well-known ideograms:

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silence silence silence

silence silence silence

silence silence

silence silence silence

silence silence silence 35

Hypothesizing that poetic devices all grow out of the poet's playfulness with words, thoughts, and language, Untermeyer talks of metaphor as

> a game in which the wit of the writer and the wit of the reader are matched. ...It is an intellectual game, this saying one thing and meaning another, a verbal sportiveness; the poet points the way, and the reader's mind romps along.[36]

Huizinga agrees: "Behind every abstract expression there lie the boldest of metaphors, and every metaphor is a play upon words. Thus in giving expression to life man creates a second, poetic world alongside the world of nature."[37] Untermeyer also views rhyme as a way of having fun with words and playing with rules:

> Rhyme itself is a form of play; it is something between a metaphor and a pun. Like a metaphor it plays with the relation that has both a similarity and a difference; like a pun it plays with a word not as a word but as a sound. Like both the metaphor and the pun, it charms the hearer with the dual pleasure of anticipation and fulfillment, suspense and surprise. ... Children enter this game and understand its rules before they leave the nursery.[38]

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Literature as a Game

There are so many ways of playing with words and putting games into a literary text, that it is difficult to distinguish the principle of "games in literature" from "literature as a game." However, just such a definition is necessary, I believe, in order to deal with as unusual a genre as "computer story-games." I propose the following general differentiation with the understanding, of course, that "games in literature" and "literature as a game" is a continuum, with Adventure on the far end of the "literature as a game" spectrum. The object of the work is the determining factor: If the main goal is for the reader to decipher some veiled meaning or to figure out the answer to a question or puzzle posed by the work, it's basic character is game-like. Frank Stockton's "The Lady or the Tiger,"39 mystery/detective literature and some aspects of hermetic and Baroque poetry can, I believe, be viewed as games. One the other hand, if a puzzle posed in the work is also answered in the work so that the reader is not responsible for the solution, it is not a game. There might be clever, playful literary devices in them that can be considered as little games, but these are used to enhance the meaning or beauty. It is then the depiction or representation of some meaning or aesthetic experience that is the main object.

Another way of differentiating "games in literature" from "literature as a game" is to determine who it is who plays the games, the reader or the author. In hermetic

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poetry, for example, the poet plays with secret messages, knowing all the while what his ciphers mean (at least, one would assume the poet knows what (s)he is writing about). The reader, however, does not know what they mean and must try to figure them out. In a poem like Donne's "The Flea," on the other hand, the author poses a puzzle, plays with it, and explains it to the reader.

The Flea

Mark but this flea, and mark in this,
How little that which thou deniest me is;
Me it sucks first, and now sucks thee,
And in this flea our two bloods mingled be;
Confess it, this cannot be said
A sin, or shame, or loss of maidenhead;
  Yet this enjoys before it woo,
  And pampered swells with one blood made of two;
  And this, alas, is more than we would do.[40]
...

There are, then, examples of traditional literary works whose basic character is that of a game. Adventure is a literary game with an added dimension made possible by the computer: interactive participation by the reader.

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Play

In Homo Ludens, Huizinga has made a strong case for the idea that the play instinct is one of the main bases of culture.[41] The most basic connection between games and literature is the element of play, from which both derive: literature and games are both forms of playing. A competitive computer game is quite obviously play, and the elements of play in poetry and literature are also clear. As Huizinga states:

> Play, we found, was so innate in poetry, and every form of poetic utterance so intimately bound up with the structure of play that the bond between them was seen to be indissoluble.[42]

Although there are other hybrids of literature and games, I believe that interactive computer story-games are the most closely bonded combination of these two functions that have yet developed. The narrated setting and the reader's interaction with the setting are the representation and imitation of an imaginary world. At the same time, the reader competes with the author of the work, and in Adventure, for ranking, i.e. against a scale based on accomplishments of other player-readers. Adventure, then, is the fusion of the principles of competition, rules with make-believe, of winning or losing with reading.

In Man, Play, and Games, Roger Caillois postulates that theater is the most basic connection between ludic behavior -- which he defines as calculation, contrivance,

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and subordination to rules (i.e. game-playing)--and mimicry or make-believe, the area to which literature belongs:

> Ludus is also readily compatible with mimicry. ... it is the theater which provides the basic connection between the two, by disciplining mimicry until it becomes an art rich in a thousand diverse routines, refined techniques, and subtly complex resources.[43]

In theater, the mimetic, aesthetic qualities take precedence over the "rules" aspects. Because computer games are in their infancy, this emphasis is reversed in interactive fiction. This does not preclude a maturation toward the aesthetic, however. As Huizinga writes:

> As a culture proceeds, either progressing or regressing, the original relationship ... does not remain static. As a rule the play-element gradually recedes into the background, being absorbed for the most part in the sacred sphere. The remainder crystallizes as knowledge: folklore, poetry, philosophy, or in the various forms of judicial and social life. The original play-element is then almost completely hidden behind cultural phenomena. But at any moment, even in a highly developed civilization, the play-'instinct' may reassert itself in full force, drowning the individual and the mass in the intoxication of a immense game.[44]

For many people, the computer is just a big, expensive toy. In "fooling around" with it, new forms and recombinations of play, games, and art are being created. Adventure makes a game out of reading, imagining scenes and events, and make-believe.

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FOOTNOTES: GAMES AND LITERATURE

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Adventure, FIRST WORK OF A LITERARY MODE IN ITS INFANCY

Adventure can provide its readers the fascinating experience of interacting on a simple level with a written text and actually having an influence on the construction of the story they are reading. The story itself, however, is of low "literary" value. One might ask whether interactive fiction will be yet another form of formula or trivial literature or mind-deadening, commercially oriented entertainment as T.V. has turned out to be. In what follows, I hope to show that the low "literary" quality of *Adventure* is a function of the immaturity of its artistic medium, not of any intrinsic technical/aesthetic limitation of the computer as a literary medium.

In general, literary criticism has as its object "belle lettres," i.e. works belonging to a canon of recognized literary works. This canon is constantly changing, and the criteria for what constitutes "good literature" are fluid and not easily defined. The study of popular literature deals with the theoretical questions about the "other" kinds of literature, which, in addition to formula or trivial literature, have variously been called folk-, minority, minor, para- or sub-literature, middle-brow literature, and the literature of Low Culture. The following are some of the issues on which the criticism of popular literature focuses that are relevant in the discussion of interactive

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fiction and Adventure: the role of the media, especially the mass media, on artistic production; the role of a mass vs. an elite audience; the results of the commercial aspects on artistic production; the difference (if any) between art and entertainment; and the related question of the criteria for distinguishing between low literature and high literature. I will be drawing on this body of study to support my contention that interactive fiction is not by nature low literature, but merely immature. To illustrate this, I will compare the first major work of interactive fiction, Adventure, to the most popular Prose Novel of Chivalry and Adventure, Amadis of Gaul,[1] and then contrast them very briefly with television serials. I will make the case that although all three forms share similar narrative structures and resulting deficiencies, television is a medium whose commercial limitations are the cause of its low literary qualities, while the media of printed stories and interactive fiction are not inherently limited.

The Prose Novels of Chivalry and Adventure were prose-versions of medieval knightly verse epics. In their manuscript form those epics had been recited to and read by the nobility and the literate upper class. The early printed prose-versions were still meant for the same educated audiences. However, since the middle of the sixteenth century they could be mass produced and were intended for an audience which primarily included people from the lower classes. The prose Romances of Chivalry and Adventure

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became the first truly popular form of printed literature and seem to have appealed to people of all classes and levels of education. Commentaries from the time are very similar to those made today about the seeming addictiveness of computers and computer games. Compare Irving Leonard's comments on the Romances of Chivalry and Adventure to Walt Bilofsky's comments on Adventure:

> "These tremendously popular works of fiction ... stimulated the emotions and won the passionate devotion of all literate classes of Spain, from the great Emperor Charles V himself to the lowliest clerk in his service. ... The pages of this chivalric fiction were thumbed with an enthusiasm amounting to a passion, and their fascination spurred the illiterate to master quickly the art of reading. ... The aristocracy of every shade and degree, including its womenkind, and even the clergy, devoted much of their ample leisure to this diverting pastime."[2]

> "Has anyone managed to stay involved in personal computing for more than a short time without getting trapped into the game of Adventure? (If some of you haven't, cancel all your appointments for a couple weeks and order up a copy.) Adventure has captured the imagination of both computing amateurs and professionals alike, and has inspired imitation like nothing since the invention of programming."[3]

Adventure and the prose Romances of Chivalry and Adventure are based on a story structure of more or less independent units which are strung together and can be expanded infinitely. This simple narrative pattern allows an unlimited number of sequels to be added later and permits multiple authorship -- both Adventure and the Romances of Chivalry and Adventure can be considered group efforts.

Amadis of Gaul, first printed in 1508, was written

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down by Garcia Rodriguez de Montalvo and based on an orally transmitted chivalric romance cycle dating back to at least 1350.[4] Montalvo conceived the original Amadis book as a means of earning money. Because of its popularity and commercial success, at least five other authors wrote sequels to it over a period of half a century. Taken together in its entirety, it is the story of "the adventures of Amadis, his family and friends, and their children through several generations."[5] It is a tale that need never have ended, for it is simply an accretion of one stirring experience after another. Each adventure is complete, a story in itself, as the following chapter headings indicate:

> Chapter XVII. How Amadis was very well liked in the court of King Lisuarte, and the news he learned concerning his brother Galaor.[6]

> Chapter XVIII. How Amadis fought with Angriote and with his brother and overcame them, who were guarding a pass into a valley at which they were maintaining by force of arms that no one had a more beautiful ladylove than Angriote had.[7]

The adventures do not have to be connected through any needs of plot; there is no buildup or culmination of action. As O'Conner observes:

> "That a book should have a unifying idea and that the various episodes should be relevant to it in some way are considerations that, while not totally alien, are scarcely native to Amadis or its genre. The division into chapters and books has no consistent structural significance."[8]

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The only connection between the basic plot units, the chapters, is spatial-temporal, i.e. something happens to the hero in one place, then he moves on, and the next event occurs. There is no internal connection, and the order in which the adventures take place does not matter. Amadis of Gaul is "long and rambling --words of praise by some sixteenth-century standards,"[9] and the effect of the whole is definitely less than the sum of its parts. The structure was uncomplicated and made few demands on the authors' abilities. The looseness of structure also proved to have other advantages besides narrative simplicity. If a volume about Amadis was popular enough to be a commercial success, it was very easy to add new books to the cycle. O'Conner believes that its length was a sign of its influence:

> "In general, the longer a chivalric prose narrative, the better and more influential it was. This kind of tale was written in such a way that, if popular response warranted, succeeding books could easily be added. Hence the number of volumes a romance finally attained is an approximate gauge of its popularity."[10]

Some of the same things hold true with Adventure. It, too, has a very loose structure and events in the story are connected successively through space and time, not by any overall organizing meaning or point toward which all actions lead. The events are more or less independent of each other. Their sequence can be changed without affecting the story because the order in which they occur is unimportant to the plot. As in Amadis, the only connection between

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experiences in Adventure is spatial and temporal: the reader wanders from one chamber in the cave to the next and either finds something of importance or something happens to him or her. There is only one type of internal structural connection between story units in Adventure: there may be some object in one location that is needed to overcome an obstacle in another. However, this is an easy device for the writers to control. Also, there is a positive aspect to the lack of a fixed sequence; it enables the reader to wander at will through the cave in any direction (s)he chooses.

Like the Amadis cycle, Adventure was written by several authors and is simply an accumulation of sub-tales. It, too, is easily expanded. One just adds another subroutine to the program, i.e. adds another adventure to the story.

Chivalric Romances have been considered "vast, almost unreadable jumble(s) of episodes that stand as a fitting monument to sixteenth-century taste for the fantastic,"[11] and in both them and in Adventure, quantity replaces quality; profuseness is a substitute for depth. In Amadis, the entangledness (which, by the way, was regarded in the Renaissance as a very positive quality in a long narrative)[12] is achieved through a veritable multitude of heroes. One hero's story is described for no more than two or three chapters at a time before the narrative switches to two or three chapters of another hero's adventures for variety. Complicatedness in Adventure is achieved through the

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difficulty of remembering the layout of the cave and through the intricacies of the puzzles and brain-teasers the reader encounters. In The Second Self: Computers and the Human Spirit,[13] Sherry Turkle notes the worship in the computer sub- culture of the fantastic, the bizarre, the complex or the intricate. This applies not only to a style of programming, but to tastes in literature (sci-fi and fantasy)[14] and music (Baroque).[15] Adventure's entangledness and complexity is considered by this group to be an asset.

The prose Romances of Chivalry and Adventure and Adventure are kindred spirits. They express a delight in childlike fantasies of overcoming all difficulties, vanquishing all foes, and being rewarded with treasure and success in the process. The hero leaves on a quest, a journey in search of adventure and reward. The hero and characters in the stories are basically cardboard figures and have no internal conflicts and can be said to have no psychology at all. The important thing in Adventure and the Prose Romances of Chivalry and Adventure is that something interesting is always happening, not the characters' personal growth or the reasoning behind their actions. In this respect both forms of narratives differ from maturation processes depicted in fairy tales, for example. This is the type of literature that appeals to the adolescent in us.

In Parameters of Popular Culture,[16] Marshall Fishwick describes the most commonly held view of Popular Literature, i.e. that it is trivial, ephemeral, and shallow

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in nature. He writes that popular literature and culture is: "designed for mass consumption and the taste of the majority. Entertainment is the key, and money is the spur. The word 'mass,' linked to media like television, radio, film, and records, is often carried over to the audience. The tacit assumption is that popular (or mass) culture reflects the values and aspirations of Everyman."[17] In this view, Popular Culture is rooted in folk culture as opposed to high or elite culture, which is produced by artists whose esoteric, artistically elaborate works cannot, by definition, have wide popular appeal. Unlike popular works meant for mass consumption, a high-culture work is "private," i.e. it is not meant for mass consumption but rather the product of an individual vision and, as Stuart Hall and Paddy Whannel put it, "bears the stamp of an original imagination; its power depends upon its capacity to force us 'out of ourselves' to attend to the range and quality of someone else's mind."[18] According to this view, Popular Literature lacks these qualities.

One eloquent critic of this type of analysis is Leslie Fiedler. He calls the separation of "song and story in High Literature and Low" an "unfortunate distinction."[19] His irreverant name for High Literature is "compulsory literature" since it is most often read because of having been assigned in an English class in school, and refers to Popular Literature as "optional literature" because it is meant to be read strictly for enjoyment. He, then, is not

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of the opinion that "entertainment" is in any sense a pejorative term or that it is a negative quality in a literary work, nor does he believe that art is somehow different from entertainment. In his discussion of optional and compulsory literature he writes:

> "It is an odd enough notion ... to "teach," say, the plays of Shakespeare or the novels of Dickens and Twain, works written to move and titillate the free mass audience: to require, in effect a pleasurable response from a captive student audience. ... But it is even stranger to insist that while it is proper, indeed incumbent on us, to find such pleasure in Shakespeare, Dickens or Twain, it is shameful or regressive to respond similarly to Zane Grey, Edgar Rice Burroughs or Margaret Mitchell; and strangest of all to work out critical "stands" for explaining why."[20]

In a chapter entitled "Literature and Lucre,"[21] Fiedler examines the connection between money and literature and disagrees with the assumption that Popular Literature is commercial in nature while High Literature is not. Far from condemning writers whose main motivation for writing is money, he believes that the literary work "remains incomplete until it has passed from the desk to the marketplace; which is to say, until it has been packaged, huckstered, hyped and sold."[22] He points out that among recognized High Culture artists who were "shamelessly involved in the marketplace"[23] are Shakespeare, Richardson, Balzac, Dickens, Twain, Fitzgerald, Faulkner, Hemingway, and Bellow.

Fiedler believes that the literary appeal and the popularity of a work are based on what he terms "mythopoeic

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power,"[24] which can be independent of formal excellence. This approach to Popular Literature is closer to that of Abraham Kaplan's, which is described in a now famous article, "The Aesthetics of the Popular Arts."[25] Kaplan differentiates Popular Art from bad art, folk art, or minor art. He considers the Rubaiyat and The Hound of the Baskervilles, for example, to be good minor art works and defines folk art as popular in the sense of being produced "anonymously, without self-consciousness, and not in an explicitly aesthetic context."[26]

Kaplan approaches Popular Art as a particular type of aesthetic experience: "popular art is not the degradation of taste but its immaturity."[27] In his view, the form of Popular Literature is immature because it is formless and easy. Popular Literature is based on stereotypes, which "present us with the blueprint of a form, rather than the form itself. ... It is not simplification but schematization that is achieved."[28] He feels Popular Literature lacks a second type of form: "Form is a displacement onto the object of the structure of our experience of the object; it is this experience that is the primary locus of aesthetic quality."[29] Another way of saying this is that Popular Art is pre-digested.

> "Popular art provides no purchase for any significant effort to make it out. ... Our interest is focused on outcomes (as in the well-named "whodunit"), but not on the unfolding of events. ... so long as we only want to know how it all comes out,

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> it comes out just as it does with no effort on our part, and we have only traced a shape rather than experienced a form. ... Direct experience is replaced by second hand apprehension, and all we know about the object is as superficial as its hold on us."[30]

According to Kaplan, not only is Popular Literature predigested for its readers, its readers cannot tolerate ambiguity: "We shrink from doing that much work--the work, that is, of creative interpretation. ... Popular art is a device for remaining in the same old world and assuring ourselves that we like it, because we are afraid to change it."[31] Finally, Kaplan says, "Popular art wallows in emotion while art transcends it, giving us understanding and thereby mastery of our feelings."[32] It is not aesthetic, but anaesthetic.

Amadis of Gaul and Adventure are both forms that fit into the category of Popular Literature and resemble popular television serials or soap operas in several respects. All were made possible because of progress made in technology. All three share the same simplistic narrative form which neglects ideas and aesthetic development in favor of action and intricacies of plot. They are based on a story structure of independent units that can be strung together infinitely and which exclude something we consider necessary for a literary work to be considered good: a unifying idea that establishes existential relevance for the audience. The sequence of the story units that are independent of some greater whole is basically irrelevant, and they allow

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unlimited additions and sequels; since they do not serve any unifying artistic vision, they do not have to be written under the guidance of one particular individual vision and permit multiple authorship. In the case of the Novels of Chivalry and Adventure the causes of these defects did not prove to be insurmountable: the Novels of Chivalry and Adventure were the literary predecessors of our great novelistic tradition (such as Don Quixote and Simplicissimus). On the other hand, different causes of the same defects in television have prevented television serials, for example, from developing as an artistic form.

The Novels of Chivalry and Adventure were eventually marked by the commercial and the market demands of the printing press medium and a mass audience. Every accusation Fishwick discussed in Parameters of Popular Culture can be leveled, for example, at Amadis of Gaul. It was originally conceived as a money-making scheme, not as an artistic endeavor. It was intended to reach a mass audience and was therefore based on the unsophisticated popular folk tradition, not on the written tradition, in which only works of great value were worthy of the work involved in producing manuscripts. In some sense, Montalvo was not even what we have come to view as a creative artist: Amadis is basically the translation of a popular folk tradition from the oral to the printed medium. The narrative strategies he used in his stories, as mentioned several times, are simplistic and an easy way of telling a story. They also contributed to his

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stories being easily understood by the widest possible audience, who didn't have to do much of what Kaplan terms "creative interpretation."[33] That his stories didn't have any unifying goal is not surprising -- there was no tradition of this in entertainment literature.

Although the Novels of Chivalry and Adventure suffer under all the ills that Fishwick ascribes to Popular Literature, there was nothing inherent in the medium, however, to prevent the development of a High-Culture tradition in printed entertainment literature. Through accident (as appears to have been the case with Don Quixote,[34] which was written as a satire on the Novels of Chivalry and Adventure) and through experience and experimentation with the printed text, authors learned how to work with the printed medium. The commercial aspects of the book-writing trade did not limit individual creativity. Other than being able to support themselves while they wrote, writers of the Novels of Chivalry and Adventure did not need great financial backing to do business. If their book did not sell well, they did not lose an investment. Also, as the market for books grew, an author had more people to sell his books to while the number of books he had to sell to bring a profit remained the same. Since the printed medium did not bring with it any inherent commercial limitations, it allowed the production of High Culture and Low Culture works.

Contrast a medium without inherent limitations, such as the printed text, to one that, from an artistic and

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creative point of view, seems fatally flawed. The commercial nature of television does prevent the development of individual creativity. It takes an enormous amount of money to produce a television program. The individual programs are not themselves sold to the audience, as books or films are, instead their costs are underwritten by sponsors. The sponsors, in turn, hope that viewers of the television programs will be motivated by the advertisements that are interspersed throughout the show to buy the sponsor's products. The emphasis therefore, is not on selling the literary product, per se, but on advertising some unrelated secondary product. Because the primary purpose of television is to sell these secondary products, all artistic considerations are subservient to this cause. Art and entertainment are not sold for themselves, but used to create audiences for the advertisements. Producers want to be able to guarantee their sponsors this audience, and they aim for general program loyalty, not for good individual works.[35]

All of this, of course, stifles creativity. Instead of judging a script for its artistic merits, market studies are done to determine what has sold well before. This is a cause of the stereotyping Kaplan deplores. Due to the unforgiving structure of television programming, a work must be constructed around rigid formula -- a few minutes of presentation interrupted at specified times by commercials, each program and portion of program exactly timed. Some authors of printed literature also faced commercially

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determined structuring of their work, but the printed medium is more forgiving. Charles Dickens, for example, wrote some of his novels in installations for publications, so he, too, was faced with deadlines and breaking the story into small pieces. His artistic works were also partially structured around non-literary considerations, but he had leeway on the length of each installment, and if it was necessary, publication could be postponed a few days. With television, the only way of maintaining the amount of material that must be presented on schedule is through multiple authorship. Ideas based on market studies and joint-effort, dead-line oriented writing do not encourage individual vision or creativity. The television medium is not merely immature. The commercial structure and barriers support the view of Popular Literature described by Fishwick and make television a hostile environment for producing works of artistic or aesthetic depth.

Adventure, as the first stage in the development of interactive fiction, seems to fit in the category of what Kaplan calls "folk art" as easily as it does into his category of Popular Literature as immature art. It was written "anonymously, without self-consciousness, and not in an explicitly aesthetic context."[36] The original writer shared his work with the computer community by declaring it "public domain" and making it available to private computer networks. The second major author gave it its general form, and from there it has become a community effort. There are

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many versions, and anyone with access to the source code can easily create their own additions.

Surprisingly, Adventure completely lacks the commercial nature which supposedly is the basis of Popular Literature. It was written for fun, not for profit of any kind to anybody. Other works of interactive fiction have been produced commercially, but there is no danger that the commercial aspects will exclude artistic development, as with television. The financial side of creating a work of interactive fiction is similar to that involved in writing a book: no great capital investment is needed. The author must support him- or herself and either be a programmer or work in conjunction with a programmer who must also be supported.

The financial side of marketing interactive fiction is also similar to the financial side of selling books; a work need not be aimed at the widest possible audience, since it is sold as an individual product. Because it is not necessary to appeal to a mass-audience, the idea of the "lowest common denominator" as a guiding literary principle is missing. If anything, one must assume that the readers of Adventure and other works of interactive fiction are more highly sophisticated and better educated than the reading audience in general. Unlike video arcade games, access to language-based computer games is more or less restricted to those who work in a computer-related industry or academia, or who own and operate a computer and the necessary

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software.

One thing that speaks for the artistic future of interactive fiction is its audience's love of complexity, difficulty, creativity, and what Sherry Turkle has called "radical individuality."[37] In Adventure this is expressed as a fascination with intricate and complicated puzzles, but there is nothing to hinder this fascination from extending to aesthetic qualities, as well. Many readers say they do not care about the puzzles in Adventure, but are caught up in the process of visualizing themselves acting in an imaginary world. Readers of interactive fiction do not shy away from ambiguity; they seek it in reading a work they must actively create while constantly facing the frustration of not knowing how this is to be done. In the section on Reader Response I will discuss the reader's tendency towards simultaneous intense emotional involvement and critical distance towards his or her actions; suffice it now to say that interactive fiction is not of any necessity pre-digested or "an anaesthetic."

Like Montalvo and the writers of the Novels of Chivalry and Adventure, Crowther did not write a creative story, per se. Adventure, too, is basically an extension of its original medium into a new medium. Amadis is the translation of an oral tradition into a printed work, and Adventure is the translation of the structures of a computer model of a cave into story form. Its narrative form is both a reflection of the structure of a computer program and a

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simple technique of story-telling that is easy to master.

There is nothing to prevent the development of interactive fiction from artistically immature works to works of High Culture. Adventure is of low literary quality first because its authors were programmers who neither intended to write a literary work nor were skilled in the use of narrative, and second because the literary aspects of the technical medium have not yet been explored. At the time of this writing, at least two promising works of interactive fiction are being written by successful authors in the Popular Literature tradition, Michael Crighton (The Andromeda Strain)[38] and Douglas Adams (The Hitchhiker's Guide to the Galaxy[39] and The Restaurant at the End of the Universe).[40] I believe that writers will first "practice" with interactive fiction by writing stories that are basically similar to the fixed-text printed tradition. With technical development of the computer medium and the growing experience of writing interactive fiction, I think a completely new type of story will someday emerge.

One difficulty I do foresee and view as inherent to the interactive computer medium will be creating non-stereotype, subtle characters with whom the reader can interact. One obvious way around this problem will be to have the reader interact with characters who are not human and will not have to respond as such, but I think a more radical solution will come to characterize interactive fiction. Because our narrative tradition is so deeply involved

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with characterization and human psychology, it is foreign for us to consider the possibility of a narrative form that does not focus on them. Unless or until artificial intelligence can imitate human language on any sophisticated level, however, I think that a new focus will be necessary, and be one new aspect interactive fiction will bring to literary tradition.

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FOOTNOTES: FIRST WORK OF A LITERARY MODE IN ITS INFANCY

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"ADVENTURE'S" RELATIONSHIP TO MYSTERY LITERATURE

In trying to categorize a new literary phenomon such as interactive fiction, it is useful to compare it to related, contemporary literary forms. One genre which interactive fiction in general, and Adventure in particular resembles, is mystery literature, a genre that can also be viewed as a game in the form of a story. Computer story-games such as Adventure and traditional mystery literature have as their primary goal the solution of a narrative puzzle. Both of these types of hermetic tales contain secrets -- and both are physical secrets, not conceptual secrets. Although most mystery stories involve crimes and detectives of some sort, they are not absolutely necessary; Poe's "Gold Bug," like Adventure, is a treasure hunt. According to Robert Champigny:

> From the reader's standpoint, a hermeneutic tale has to be an investigation story but the narrated process does not need a fictional investigator in order to function as an investigative sequence.[1]

Adventure and mysteries, as popular literature, are based on their common goal of presenting and solving a mystery, they resemble each other in important aspects of plot, some structural features, and in the dynamics of their readers' responses. Understandably, they also appeal to their readers for some of the same reasons. Despite their being "trivial literature," their audiences are not

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necessarily those one usually associates with "pop" best-sellers and other forms of "formula literature". Mystery literature has been called the popular, or "formula literature" of the intellectual,[2] and I believe that computer story games can be viewed in the same way.

Ever since Poe wrote the first detective story in 1841 ("The Murder in the Rue Morgue"), mystery, detective and spy stories have been compared to games. It comes as no surprise that Poe was a "master at solving cryptograms and other complicated thought problems."[3] The stages in the genre's historical development are even designated by the different types of games to which they are compared: the early stories such as the Sherlock Holmes series are called crossword-puzzle types,[4] mystery novels like those of Agatha Christie and Dashiell Hammet called puzzles of interlocking pieces,[5] and the James Bond and spy stories compared to games of chess.[6] As Nigel Morland writes:

> ...the novel of pure detection, in which action and physical excitement are at a minimum, and the whole emphasis falls on the niceties of deduction; these stories are puzzles pure and simple and entirely intellectual in their appeal...[7]

Some writers and critics have even established game "rules" to make sure the game or competition between the reader and the characters, or the reader and the author, is fair. One of the first and most important of the guideline-makers was R.A. Knox,[8] who set forth ten rules to give the reader a sporting chance--such as that the author

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must at least mention the criminal early on in the story, no supernatural elements may be introduced, there may not be more than one secret passage per story, no secret twin-brothers or sisters may be suddenly appear to explain the crime, and so on. The idea that mysteries are games with rules and that the author must "play fair" with the reader can be seen in the humorous initiation oath of the famous "Detection Club," founded by G.K.Chesterton, Anthony Berkeley Cox, Agatha Christie, Dorothy Sayers and others:

> Ruler: Do you solemnly swear never to conceal a vital clue from the reader?
> Candidate: I do.
> Ruler: Do you promise to observe a seemly moderation in the use of Trap-Doors, Chinamen...and utterly and for ever to forswear Mysterious Poisons unknown to science?[9]

Members of the authors' club are also forbidden to have their detectives use "Feminine Intuition, Mumbo-Jumbo, Jiggery-Pokery, and Coincidence" in solving the puzzles.[10] In 1928, S.S. Van Dine (a pseudonym for mystery writer W.H. Wright) provided twenty rules for mystery fiction so the reader would have an "equal opportunity with the detective for solving the mystery."[11]). In "The Simple Art of Murder," Raymond Chandler concluded that Van Dine's rules were artificial and that they kept mystery literature from developing into an art form. He proposed changes to make mysteries more realistic, such as allowing professional criminals to commit the mysterious crimes, and accepting psychological factors

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as the basis of a plot.[12]

One of the few critics who denies any competition between the reader and the writer is William Aydelotte. He writes:

> A detective story is not an invitation to intellectual exercise or exertion, not a puzzle to which the reader must guess the answer. On the contrary, the claim of detective stories to be puzzle literature is in large part a fraud, and the reader, far from attempting to solve the mystery himself, depends on the detective to do it for him."[13]

He reasons that there is no competition, because the reader does not really have all the information necessary to solve the case; the writer hides or distorts the facts in order to fool the reader. I do not believe that this reservation refutes the game-like character of the detective genre. Trickery and the ability to manipulate rules to one's own advantage is an admired quality in gamesmanship. Even Aydelotte concedes that the fact that sets of rules like these have evolved and constantly been redefined is of importance. As he says, because mystery literature is so often regarded as a genre of intellectual games, writers are more likely to try to create puzzles that are fair and readers are more likely to be lead to read detective stories as puzzles, whether they are actually puzzles or not.[14]

Readers of "game-literature" such as mystery stories and computer story games delight in the suspense of guessing what happened, what will happen, and what will have happened, and they love matching wits, or imagining that they

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are matching wits, with the author. In the eyes of readers, the fascination of the intellectual challenge in mystery literature and Adventure seems to make up for other literary weaknesses. Characterization and style have suffered from the all-consuming goal of making the plot as thick as possible. Also, in both Adventure and in detection literature, events and characters' choices are often not explained psychologically. The emphasis is on the who, what, when, where, and how--not on the why.

> One can always invoke some kind of madness or a desire to commit a perfect crime. After all, the function of the murderer in a detecive-and-opponent story is to test the detective. Other motives are ornamental."[15]

In mystery stories, the crime that has been committed at or even before the beginning of the story is of minimal value in and of itself. As Jochen Vogt explains, first the author establishes that the crime is in fact puzzling; then the detective appears on the scene a the professional unraveller of the secret.[16] The crime, which gives the puzzle shape, is interesting solely in its function of providing the motivation for the important part of the story--the hero's process of unravelling the mystery. Yet the author does not have to provide any plausible motivatation for the crime itself.

In Adventure, too, there is a curious lack of motivation for the things that take place. This is probably due to its having been written as a game: in games it is not

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very important that the fantasy setting makes sense to us. In the Adventure world, the puzzling and improbable events are explained away as magic. There is no reason given to explain why there should be treasures hidden in the cave or why a small bird can kill the fierce green snake. In a world governed by magic, things need no explanation. They happen, just as wondrous events happen in fairy tales, such as people being turned into animals, animals being able to talk, or Walt Disney fairy godmothers turning pumpkins into golden coaches. Furthermore, the lack of motivation that characterizes mysteries has another facet to it in Adventure, for much of the story in Adventure -- the problem solving part -- does not take place in the text at all. In mysteries, the author describes step by step how the protagonist unravels the puzzle. The motive given to explain why the crime had been committed in the first place might not bear much scrutiny, but every action the protagonist takes in solving the crime's secret is explained, rationalized, and described in great detail. There is a reason behind every move the protagonist makes; half the fun of reading mysteries is being led and mislead by the protagonist's reasoning process.

In Adventure, on the other hand, it is the reader who goes through the process of solving the puzzles, and the reader does not get to explain the line of reasoning behind the choices he or she makes. If two or more people play Adventure together, they often discuss not only what to do

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next, but why they think some move will work or not. While the solitary reader does find out from the results or lack of results of his or her input whether the reasoning is correct or incorrect, the pleasure of having this thinking process discussed and described is missing. In Adventure, both the fictional world and the reader's response to it remain unexplained.

While Adventure and mystery literature resemble each other closely in their game-like character and in some of the resulting literary effects, it comes as a surprise that they are quite possibly only distantly related in structure.

Vladimir Propp analysed Russian folktales and discovered that they have an underlying structure which is common to them all.[17] Since computer story-games are structured computer programs,[18] their underlying structures are easily determined. The same cannot be said of mystery literature; Buchloh and Becker state categorically that there is no single form of mystery literature.[19] They discuss four separate main types of mysteries which they believe could be structurally modelled, but even these categories they find to be too general. Their categories are: 1. The pure mystery, or "crossword puzzle type,"[20] 2. The mystery as "novel of manners,"[21] 3. The psychological criminal novel[22] and 4. The Thriller.[23] Morphological analyses of mystery literature have been done, but mostly they have referred to individual works, not even to sub-categories, much less to the genre as a whole. To date, no

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definition of mystery literature exists, morphological or otherwise. Instead, critics have examined only story elements, such as character-configurations, setting, kinds of action, and the various types of detectives.[24]

The nature and character of the puzzles in mystery literature and in Adventure are different. In traditional mystery literature, the puzzles usually consist of crimes which have already taken place or of the attempt to thwart plans that have already been set in motion, and the detective and reader must try to reconstruct what has already happened based on the clues they come across and their knowledge of human nature and the surrounding environment. The logic is one of deduction.

Sherlock Holmes is the most obvious example of the detective as a "thinking machine," one who has mastered this "science of deduction and analysis."[25] This method of detection has its philosophical roots in the optimism of the enlightenment.[26] It is the principle that when everything impossible has been excluded through a process of deduction, the only remaining possibility, no matter how improbable, is the answer. Paul Buchloh writes that the clever cover-up of a crime by the criminal can be unmasked through the ingenuity of the detective.[27] "What is hidden in the story," he says, "will be brought by the story to light.[28] Sherlock, and to a lesser extent his friend, Dr. Watson, are representatives of the scientific method: they base their analysis on exact measurements and keen observations,

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deduction and combination. Then they, or at least Sherlock, test their hypotheses through experiment.

The puzzles in Adventure are of a completely different nature, are based on a different logic, and I believe are grounded in a different and new philosophical background. In Adventure, the secret is not known in advance, and it soon becomes clear to the reader that different rules apply than in familiar mystery literature or in the real world. Instead, readers often come across objects that are clues to puzzles they will encounter in the future. As in mystery literature, place and setting are important. Whereas mysteries are usually built around one main puzzle with the story telling about the process of solution, Adventure has many puzzles; the process of solving the puzzles is silent, since it takes place in the reader's head.

Unlike mystery literature, a temporal distinction plays a crucial role: the puzzles in Adventure are always to be found in the present and in the future. In mystery stories, the process of deduction dictates a type of reconstruction of what must have happened at some point in the past. In a type of retroactive denouement, the detective and reader base their analysis on deduction. In an interactive game such as Adventure, the reader is not necessarily presented with a problem that has occured or been set into motion in the past. Instead, she or he must take the initiative to uncover the problems, which are temporally ahead of one in the game, either directly in front of the reader

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(in the present tense), or far ahead, at some unknown time in the future. Also, the reader doesn't even know what the problems are going to be that he or she will encounter. In mystery literature, the problem is stated at the beginning -- a murder has taken place, a valuable object has been stolen, or a wicked plan has been hatched.

The logic needed to solve the problems in Adventure is not identical to that needed for reading traditional mysteries. Adventure is based on the type of thinking involved in solving and debuging computer programming problems. Let me describe in more detail how one solves two types of problems in Adventure.

One of the first puzzles the reader confronts in a cave is having the way barred by a fierce green snake.[29] Based on our knowledge of snakes, the answer to this problem should be clear. We know that snakes are dangerous, but that they usually attack as a form of defense. We know animals often attack if their territory is invaded, that they are often more afraid of us than we of them, and that they will try to run away from us if at all possible. It is not in the nature of snakes to "stand guard" over an object or a place. Three logical solutions to this problem might be to frighten the snake away by throwing rocks or making noise, to kill it with rocks or with the axe we're carrying -- or the most likely solution -- to just keep our distance and avoid it.

In the cave, however, animals do not behave as they

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do in real life, according to natural laws. If the reader tries to frighten the snake, the narrator-guide replies it doesn't understand. If the reader tries to attack the snake, the response is "Attacking the snake both doesn't work and is very dangerous."[30]. Should the reader try to avoid it or go around it, the narrator says "You can't kill the snake, or avoid it or drive it away or anything like that. There is a way to get by, but you don't have the necessary resources right now."[31]

The first step in solving this specific problem, which is a similar technique in most of the puzzles in the cave, is usually trial and error. Most readers do try to scare, kill or walk around the snake. When they discover that these do not work, they review in their minds what they have found in the cave up till this point: a birdcage,[32] a cheerful little bird,[33] and a rusty rod with a star on the end of it.[34] Many readers try to throw the rod at the snake, thinking it must be some sort of magic weapon. The result? "You can't kill the snake, or drive it away, or avoid it..."[35] The only thing left to try is to catch the bird and release it near the snake. "The little bird attacks the green snake and in an astounding flurry drives the snake away."[36]

This type of reasoning is based on a familiarity with games and rules,[37] not on the ratiocination of mystery literature. Not surprisingly, it is very much like the reasoning needed in computer programming, i.e. understanding

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and manipulating arbitrarily established rules. Many people consider computer programming to be the ultimate game, and each programming language as a different set of rules. One of the rules of the game of Adventure is this: if readers find some object in their wanderings, no matter what it is and how useless it might seem at the time, they should pick it up and take it with them. They will probably need it for a problem they will encounter soon. The second principle for solving problems in Adventure is trial and error. This is one of the secret principles of computer programming. Programmers are taught not to to solves problems by trial and error; nevertheless, many of them do.

Trial and error is also a good approach to the Persian rug problem. At one point in the cave the reader comes across a dragon lying on a precious Persian rug.[38] I have seen the problem solved in two ways. One reader reasoned that dragons breathe fire, and that the nearby stream was the clue pointing to the solution of the problem. When he poured water on the dragon it did die, but the water ruined the Persian rug. Another reader got frustrated when he couldn't find any clues and told the guide to kill the dragon. The guide answered, "What, you want me to kill a dragon with my bare hands?"[39] When the reader flippantly typed in "yes," the guide responded, "Congratulations! You have just vanquished a dragon with your bare Hands! (unbelievable, isn't it?)" [40]

There is another area in which Adventure and mystery

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literature differ. Mystery literature makes abundant use of realistic elements as a means of leading the reader to believe that the story is, or could be, true. Adventure lacks any pretext of truth or reality. The mundane serves different functions in mystery literature and Adventure.

Mystery literature is famous for detailed and accurate descriptions of setting. Sherlock Holmes knows every street in London, and most of his literary descendents have a sense of orientation like geographers. Many descriptions are so true to life that mystery readers can often find their ways through the cities in the stories by using the books as maps. It is as if the detectives view their surroundings with a detached eye and nothing, but nothing, escapes their notice.

Although there are many realistic elements used in mystery literature, it is certainly not the case that mystery literature is realistic. As Robert Champigny writes: "fictional murder, investigation, and investigator are ... bathed in unreality."[41] As I have mentioned before, a mystery author needn't bother giving any more elaborate explanation of a murderer's motivation than madness or the desire to commit a perfect crime. Detective characters such as Sherlock Holmes, Miss Marple, or James Bond are clearly fantasy figures; it is difficult to imagine them as real people.

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Despite these differences, however, there is a strong connection between games and mystery literature, i.e. the overriding goal of solving a puzzle and the aspect of irreality. Indeed, several recent works of interactive fiction are mystery stories: in "Deadline" the reader is the detective for a murder that has been committed and must analyse the police reports, question suspects, and send evidence to the crime lab;[42] in "Witness" the reader is not only the detective, but also provides the evidence at the accused's trial.[43] Based on this natural affinity, I believe it likely that mystery literature will add a new computerized dimension and that writers of mysteries will be among the first to take advantage of the literary possiblities this new medium has to offer.

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FOOTNOTES:
"ADVENTURE'S" RELATIONSHIP TO MYSTERY LITERATURE

1. Robert Champigny, What Will Have Happened: a Philosophical and Technical Essay on Mystery Stories (Bloomington, London: Indiana University Press, 1977), p. 15-16.

2. R. Austin Freeman, in: Paul Buchloh and Jens Becker, Der Detektivroman: Studien zur Geschichte und Form der englischen und amerikanischen Detektivliteratur (Darmstadt: Wissenschaftliche Buchgesellschaft, 1973), p. 70.

3. Klaus Guenther Just, "Edgar Allan Poe und die Folgen," in: Jochen Vogt, Der Kriminalroman: Zur Theorie und Geschichte einer Gattung, Vol. I (Muenchen: Wilhelm Fink Verlag), p. 13.

4. Paul Buchloh and Jens Becker, Der Detektivroman: Studien zur Geschichte und Form der englischen und amerikanischen Detektivliteratur, (Darmstadt: Wissenschaftliche Buchgesellschaft, 1973), p. 70.

5. Buchloh and Becker, Der Detektivroman, p. 53.

6. Umberto Ecco, "Die Erzaehlstrukturen bei Ian Fleming," in: Jochen Vogt, Der Kriminalroman, p. 268.

7. Buchloh and Becker, Der Detektivroman, p. 82.

8. Buchloh and Becker, Der Detektivroman, p. 80-95.

9. Buchloh and Becker, Der Detektivroman, p. 85.

10. Buchloh and Becker, Der Detektivroman, p. 85.

11. Buchloh and Becker, Der Detektivroman, p. 86.

12. Buchloh and Becker, Der Detektivroman, p. 91.

13. William Aydelotte, "The Detective Story," in: Irving Deer and Harriet Deer, The Popular Arts: A Critical Reader (New York: Scribner's Sons), p. 144.

14. Aydelotte, "The Detective Story," in Deer and Deer, The Popular Arts, p. 145.

15. Champigny, What Will Have Happened, p. 18.

16. Jochen Vogt, Der Kriminalroman, p. 14.

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17. Vladimir Propp, Morphology of the Folktale, trans. Laurence Scott (Austin and London: University of Texas Press, 1977).

18. A structured program is one in which the number of branching statements is minimized. The problem to be solved is broken down into easily manageble sub-problems, each of the solutions to the subproblems is a subroutine and the main program consists almost entirely of subroutine calls. See also Kenneth Bowles, Problem Solving Using PASCAL, New York, Heidelberg, Berlin: Springer Verlag, 1979, p. 539.

19. Buchloh and Becker, Der Detektivroman, p. 15.

20. Buchloh and Becker, Der Detektivroman, pp. 70-73.

21. Buchloh and Becker, Der Detektivroman, pp. 73-75.

22. Buchloh and Becker, Der Detektivroman, pp. 75-77.

23. Buchloh and Becker, Der Detektivroman, pp. 77-79.

24. Buchloh and Becker, Der Detektivroman, p. 15.

25. Buchloh and Becker, Der Detektivroman, p. 20.

26. Buchloh and Becker, Der Detektivroman, p. 40.

27. Buchloh and Becker, Der Detektivroman, p. 35.

28. Buchloh and Becker, Der Detektivroman, p. 35.

29. Adventure, l. 1191.

30. Adventure, l. 1382.

31. Adventure, ll. 1352-1354.

32. Adventure, l. 1174.

33. Adventure, l. 1183.

34. Adventure, l. 1176.

35. Adventure, l. 1352.

36. Adventure, ll. 1364-1365.

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37. Walt Bilofsky, "Adventures in Computing," Profiles, Vol. 2, No. 1 (1983), pp. 24-25.

38. Adventure, ll. 1306-1307.

39. Adventure, l. 1385.

40. Adventure, ll. 1243-44.

41. Champigny, What Will Have Happened, pp. 50-51.

42. Thomas Enright, "Choose Your Quest: There's More to Text Adventures than Fighting Dragons" in: Profiles: The Magazine for Kaypro Users, Vol. 2, No. 1 (1983), p. 36.

43. Enright, "Choose Your Quest," pp. 42-43.

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A STRUCTURAL ANALYSIS OF "ADVENTURE"

The following structural analysis of Adventure is modelled on Vladimir Propp's approach to Russian folktales.[1] Propp, who showed that all of the folktales he studied have the same underlying structure, defined the elements and functions that make up this basic structure and described their relationships to each other. Proppian analyses are appropriate for texts which emphasize strong, clear plots over psychologically-oriented works with little or no action. The literary aspects of Adventure, i.e. the narrative descriptions of the cave setting and figures in the cave, lead readers to imagine what their actions would be in the cave situations they encounter. In that sense, Adventure is action-oriented. There are many elements, functions, elemental and functional relationships, and moves that Propp describes in simple folktales which form the structural basis of Adventure as well.

First, Propp studied the tale according to the ways in which the dramatis personae function, i.e. according to the significance of the characters' actions in the course of the fictional events.[2] He determined that although there are innumerable characters, the number of their functions is very limited, and that this accounts for the dual quality of the tale, i.e. "its amazing multiformity, picturesqueness, and color, and on the other hand, its no less striking uniformity, its repetition."[3] At least on the surface, the

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way in which the figures whom the reader encounters in Colossal Cave function corresponds to Propp's categories describing the folktale. While the number of functions and variations known to the folktale are limited in number, the functions in Adventure are also limited by the lack of sophistication in their development. This is due in main part to the Adventure characters' lack of depth and symbolic meaning as compared to the archetypal characters and dynamics of the folk- or fairy tale.

The main function-pair in Adventure is what Propp calls "Lack" and "Lack Liquidated," which is also the culmination of the narrative in folktales:

> VIIIa. One member of a family either lacks something or desires to have something.[4]

and

> XIX. The initial misfortune or lack is liquidated.[5]

Other Proppian categories to be found in Adventure are villainy:

> VIII. The villain causes harm or injury to a member of a family[6]

departure:

> XI. The hero leaves home[7]

> XIV. The hero acquires the use of a magical agent.[8]

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struggle:

> XVI. The hero and the villain join in direct combat,[9]

victory:

> XVIII. The villain is defeated[10]

and return:

> XX. The hero returns[11]

I will also discuss several Proppian functions which appear in the computer game only in a highly modified form.

Propp found that the sequence of functions in folktales never changed, which led him to number them as he did. Although I will follow his numbering order in the following breakdown of Adventure's functions, it must be kept in mind that the sequence of events in interactive fiction is not the same as in a fixed text. I will talk about both the nature of the characters and the sequence of functions in more detail in the interpretation section of this chapter.

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Proppian Categories of Character Functions

VIII. The villain causes harm or injury to a member of a family (A: Villainy)[12]

Propp believed villainy to be the most important function in the folktales he examined--more important even than lack.[13] This is not the case in Adventure. In my view, the lack of true villainy constitutes one of the main structural and ideational differences between folktales and Adventure. Folktales are the artistic, action-based representation of a specific form of idealistic folktale-ethic[14]; Adventure does not deal directly with ethical problems.

According to Webster, a villain is "a person guilty of evil deeds...or a wicked character in a novel, play, etc. who opposes the hero."[15] In folktales, the villain is the symbolic representation of forces working to seemingly hinder, but actually promoting, the hero's or heroines' development. For the child, these forces are perceived as "evil" impulses directed against it.[16] Propp defines several forms of villainy that could be seen as being applicable to Adventure, e.g. seizing the magical agent (A2),[17] plundering (A5),[18] causing bodily harm (A6),[19] and committing murder (A14).[20] In Adventure, however, the meaning and emotional impact of these actions is so watered down that I don't believe one can speak of villainy. The two types of figures who oppose the hero, dwarves and the pirate, are not capable

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of "evil." They do things that hinder and threaten the reader; they steal the reader's treasure and even "kill" the reader, although "death" is meaningless and not even always permanent in the game. But since Adventure's "villains" are not representations of anything else, neither parental figures nor psychological drives or impulses, their deeds are destructive without being "wicked." The pirate and the dwarves in Adventure are not artistically or psychologically effective as villains because they are stick figures which have nothing to do with ethics, "good" or "evil," or aspects of personal devolvement.

The reason Propp considered villainy so important is because it is the prime motivator of action in folktales. He states "...the complication is begun by an act of villainy."[21] This is not the case in Adventure. When the reader begins the game and is standing on the road, nothing has been done to him or her, nor does the reader lack or suffer from anything. The reader plays the game and initiates actions out of a desire for adventure, fun, and to gain a sense of achievement and personal power, not to resolve any difficulties. Later, when the pirate steals the reader's treasure or the dwarves attack, it does not provide one of the main complications of the story. They are just two among many minor difficulties the reader encounters along the way in the cave.

VIII.a One member of a family either lacks

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> something or desires to have something. (a: lack).[22]

In the opening scene, the reader is told that there are treasures to be had in the nearby cave, but that there will be great danger involved in obtaining them. The reader desires, but doesn't actually "lack" the treasures and goes in search of them. In Propp's terminology the protagonist (the reader) is a seeker hero. This function is repeated again and again in Adventure.

Although Propp does not list all the possible types of objects the protagonists in folktales can lack or desire because the list would be too long and because the objects do not determine the structure,[23] it is certainly possible to determine what types of objects a reader can lack in Adventure: magical agents (a2), wondrous objects (a3), the treasures themselves (a5), and such rationalized forms as the means of existence or money (a5).

The first puzzles in Adventure revolve around obtaining the mundane objects needed to explore a cave, i.e. the key to unlock the grate at the cave's entrance, a source of light, food and water. Later on, the reader must continue to keep track of supplies. There are a few more instances when the reader lacks rationalized means of existence--in order to obtain more batteries for the flashlight, for example, the reader must drop coins in a vending machine at the end of a maze. Mostly, though, the objects lacking are from the more imaginative categories: magical agents such as the

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wand, which creates a crystal bridge across the fissure; wondrous objects, like the bird that kills the snake; and of course the treasures in the cave, the precious Ming vase, the silver, gold, diamonds, and so on.

XI. The hero leaves home. (Departure)[24]

While the reader does go away on his or her explorations at the beginning of Adventure, in no way does this express the implications that the idea of "leaving home" in folktales does. First, the reader's starting place is on a road; the reader-protagonist is therefore already underway when the story begins and doesn't depart from anything or anyplace. But more importantly, to leave home means many things in a folktale because "home" is not just a place, but a multi-faceted symbol. When a hero or heroine leaves home in a folktale, the story often deals on a deeper level with the existential goal of achieving sexual, emotional, or intellectual maturation. Multiplicity of meaning and symbolism are missing in Adventure, and the "departure" in folktales, with all its emotional and symbolic content, cannot be equated with the reader's departure in the Adventure, which is simply the first move in a game.

The function in fairy tales defined by Propp as the hero leaving home is therefore found in only a modified form in Adventure. They are similiar in that the seeker-heroes in both types of works have search as their goal, but besides the dissimiliarities in meaning and effect that I mentioned

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above, there is also a major structural difference. Propp observed that in folktales, the function of departure is always followed by the appearance of what he calls a donor, from whom the reader obtains some necessary (usually magical) agent.[25] There are many obstacles in the cave that can only be overcome by some special agent, but the reader acquires them one by one, by him or herself; they are not given by a donor, who is -- in folktales -- a psychological entity.

There is only one case which might fall into the category of the reader's meeting a donor: a bear locked up in a golden chain who can be helpful to the reader if it is released. When the reader-explorer discovers Barren Room, (s)he finds that there is a "ferocious cave bear eying you from the far end of the room! The bear is locked to the wall with a golden chain!"[26] When the reader throws the bear some food, it becomes calm and friendly, and if it is released it follows the reader through the cave. Should the reader meet up again with the troll who demands a treasure before it will allow anyone across the toll bridge it guards,[27] the bear will drive it away and no toll will be necessary.

However, even though the bear acts in a way that is positive from the reader's point of view, I don't believe it can be called a donor. If a story is not morally grounded, just as there can be no real villainy, there can also be no real donors. The most that can be said about the figures in

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Adventure is that they function in a mechanically destructive way toward the reader-protagonist. There are no figures in Adventure who have, or are capable of, any particular goodwill towards the reader-protagonist.

> XIV. The hero acquires the use of a magical agent. (F: provision or receipt of a magical agent.)[28]

In Adventure, the reader must obtain and figure out how to use many objects that work in magical or wondrous ways in the cave. Propp lists nine forms by which magical agents can be transferred in folktales, but although there are many magical objects in Adventure, there are only three forms of transfer in the game.

F1. The agent is directly transferred.[29] According to Propp, this form often takes on the character of a reward or gift given by someone. Although there are no other characters in Adventure to give the reader any presents, sometimes the reader overcomes obstacles to obtain the magical object, and the idea of it being a reward is implicit in the act of winning it.

F5. The agent falls into the hands of the hero by chance (is found by him).[30] This is by far the most common way the reader obtains the wondrous objects in Adventure. In most cases, the reader more or less stumbles across the magical or wondrous agents as (s)he explores the cave.

F8. The agent is seized.[31] There are two examples of this form of agent transfer in Adventure. The reader can

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find the treasure that the pirate has stolen in the maze, and when the bear chases the troll away, the troll drops the treasures that have been tossed to it, which the reader can then claim as his or her own.

XVI. The hero and the villain join in direct combat. (H: struggle)[32]

This function, too, has considerably more importance in the folktale than in Adventure. As I have already pointed out, at random intervals in the game the reader is forced to fight the attacking dwarves, but this struggle has no ethical or symbolic implications for the story. In folktales, the villains are usually closely connected with the the underlying function of the story: either they have caused the initial misfortune (VIII. villainy), or they prevent the hero from obtaining the person or object needed (VIIIa. lack). The dwarves in Adventure do not guard anything, nor do they want to prevent the protagonist from getting any magic object or treasure. They serve as a means of testing the reader, but the question is only whether the reader picked up the axe when (s)he last saw it, or if the reader knows the cave well enough to escape the dwarf by fleeing to one of the places where they can use a magic word to get back into the safety of the building.

XVIII. The villain is defeated (I: victory)[33]

If the reader does possess the axe when a dwarf

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attacks, it is possible to "kill" the creature. Its body will then "vanish up in a cloud of greasy, black smoke."[34] The reader doesn't actually have much control over the struggle; it is not depicted in detail and it doesn't appear to depend on any observable skill. The only thing the reader can command that the narrator understands is "throw axe." It doesn't understand "kill dwarf," or "run away" or "hide." Since the dwarves are just a random game factor and the outcomes of struggles with them basically outside of the reader's control, the functions that are connected with them (struggle and victory) are not ethically meaningful for the action in Adventure as they are in folktales.

XIX. The initial misfortune or lack is liquidated (K: lack liquidated)[35]

For the Adventure reader, every time (s)he experiences the sense of missing something, be it a treasure or some object necessary to continue, the main game function pair of "lack-lack liquidation" is activated. The reader's feeling of lacking something is relieved when (s)he obtains the missing object. Propp describes eleven different ways this happens in folktales; in Adventure there are five:

K1. The object of a search is seized by the use of force or cleverness[36] This is the usual way in Adventure of obtaining the treasures, for each treasure is protected by a puzzle of some sort. For example, even if the reader finds the precious Ming Vase,[37] because the narrator only

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understands the word "drop," and not "place" or "put," there is no way to place it on ground without breaking it. The reader must figure out that the velvet pillow (s)he found earlier is meant to "cushion" the fall of the vase.[38] The reader must first drop the velvet pillow, and only then drop the vase on it.

K4. The object of a quest is obtained as the direct result of preceding actions.[39] In Adventure, these "preceding actions" can be understood as the reader's accomplishment in exploring the cave and finding the objects.

K6. The object is obtained instantly through the use of a magical agent.[40] When the reader waves the rod at the impassable fissure, for instance, a crystal bridge appears.

K7. The object of search is caught.[41] There is only one example of this in Adventure. The reader must catch the bird to kill the snake.[42]

K10. A captive is freed.[43] Again, this takes place only once in the game. If the reader feeds the bear and releases it, the reader can take its golden chain as treasure,[44] and the bear will frighten away the troll.[45]

XX. The hero returns (return)[46]

This takes place in Adventure whenever the reader returns to the building on the surface and drops the accumulated treasure. This can be accomplished by retracing one's path, or by knowing which caverns in the cave have magic words associated with them. If the reader knows the correct

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magic word for the particular cavern, (s)he will be transported instantaneosly back into the building.

Non-Proppian Character Functions in Adventure

There are several functions and story outcomes in Adventure that Propp did not describe in folktales. I have called them death, reincarnation, losing, and quitting. So as not to confuse the Proppian designations by alphabetical characters with my own, I have doubled the characters used to designate functions peculiar to Adventure, i.e. XX, YY, ZZ, and QQ.

(XX: death) The hero(ine) dies.[47]

Fairy tales usually end with the successful achievement of the goal by the protagonist,[48] but it is in the very nature of games that the outcome must be unpredictable. In folktales, when the protagonist and villain join in direct combat, the hero wins. This is not necessarily the case in Adventure; here the hero(ine) can be defeated in combat with the dwarf and be killed,[49] fall into a pit and break every bone,[50], or be buried in a river of molten lava,[51] to mention a few of the possibilities for death. When the Adventure reader "dies," one of two things result: either the hero(ine) loses the game, or (s)he is reincarnated. Again, there are no categories defined by Propp which describe these possibilites.

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(YY: reincarnation) The hero(ine) is reincarnated.

Whenever the reader gets killed, the narrator asks if it should attempt reincarnation.[52] If the reader agrees and the reincarnation is successful, the reader will find him or herself back in the building. There is no guarantee, however, that the reader will still possess the lamp. If the reader was "killed" and reincarnated in a magic room in the cave, i.e. a room where the reader need only say the magic word to be magically transported to the building and back again,[53] it is possible for the reader return there and pick up the lamp where it was dropped. The game can be continued. However, if this procedure is not possible, the reader loses the game--either by being forced to quit, or by stumbling in the dark into a pit.

(ZZ: losing) The hero(ine) loses the game.

One loses Adventure by dying without being reincarnated, or by using too many moves without gaining any treasure or going anyplace. The narrator then states:

N: Now you've really done it! I'm out of orange smoke. You don't expect me to do a decent reincarnation without orange smoke, do you?
P: yes
N: Okay, if you're so smart, do it yourself! I'm leaving![54]

(At this point, the game is over and the reader's score and ranking are displayed.)

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(QQ: quitting) The hero(ine) quits the game.

This can happen at any time and can either be completely voluntary on the reader's part, or happen under duress. For example, if a reader has lost the lamp, it is certain that (s)he will fall into a pit and die within a few moves. Rather than die and lose the game, most people will quit voluntarily. The narrator asks if the reader really wants to quit, and if the answer is "yes" the player's score and ranking are displayed.

Other Elements Described by Propp

Propp also talks about some other story elements besides the character functions that are very important in the folktale. One of these other elements, which Propp calls notification,[55] also plays a role in the development of action in the computer game. In Russian folktales, when the individual functions in a sequence of functions are performed by different characters, each character must find out in some way what has happened previously. This element of notifying the characters often serves as the logical bridge between functions. Propp writes "... an entire system for the conveying of information has been developed in the tale, sometimes in very artistically striking forms."[56]

There are many cases of notification in Adventure, but unlike the communications in folktales, the messages in Adventure are usually not transmitted through any

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characters. They appear in rather unlikely shapes and places, either as a voice apparently coming from nowhere, or written on tablets in the wall, or even as signs or instructions. For example,

> At "y2": A hollow voice says "plugh."[57]

At the end of the maze the reader is informed:

> There is a message scrawled in the dust in a flowery script, reading: "This is not the maze where the pirate leaves his treasure chest."[58]

Or again:

> There is a massive vending machine here. The instructions on it read: "Drop coins here to receive fresh batteries."[59]

In both Adventure and folktales, notifications are used to provide the information necessary to connect various functions, but in Adventure, they also are needed as hints to the reader. If the writer-programmer had not provided them, the reader would not have nor be able to get the information (s)he needs to figure out the solution to the puzzle in question.

The Sequence of Functions in Adventure

Propp discovered that the sequence of the functions in folktales is stable. But a computer story game is different from oral or written fairy tales. It is a printed

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text, but it is neither a fixed text nor is it read in a linear fashion, i.e. from beginning to end. Although the internal, programmed structure of Adventure is similiar to that of the folktales described by Propp, it is left to to the reader to determine which fictional events will take place, their order, and thereby the actual sequence of the functions.

Each trip through the cave with its accompanying story in the reader's mind can be different if the reader wishes it. (S)he can choose where to go in the cave as well as which objects to carry. If a reader cannot figure out how to solve the puzzle connected with a particular treasure, (s)he will not be able to obtain it. The reader can also choose not to pick up any treasures or solve any puzzles, but simply explore the cave.

The reader, then, has some choice about which functions his or her journey will contain. If, for example, the reader plays the game with the sole intention of exploring the cave, but not in obtaining any treasures, there is neither lack, nor lack liquidated. According to Propp, most folktales are motivated either by lack or by misfortune. In this respect, Adventure would not be structurally related to folktales. In some sense, the individual readers determine the structure and nature of each journey of the imagination taken in Adventure.

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Is "Adventure" an Undeveloped Form of the Folktale?

The structure of Adventure is to some degree related to that of the folktale, yet there is a significant structural difference between the two: despite the constant action, Adventure has no plot. The opening lines of the game let the reader know there are treasures in Colossal Cave, but most of the readers I interviewed said they were impelled by curiosity and challenge, not by a need to win points, i.e. not by a "lack" of points. Generally, the only time readers feel they lack something is when they are trying to solve a puzzle and know they are missing some necesary object.

With neither "villainy" nor "lack," nor even a true "departure" to set the tale in motion, there is no beginning as there is in folktales. There are three main areas for the reader to explore: the ground above the cave, the main cave, and the wizard's cave, but other than this, there is little suprastructure. Because there is no real departure for the reader, the only focal point of reference in Adventure is simply a place, the building where the reader can drop and save any acquired treasures, and not a state of being or stage of development. Without a beginning, there can be no progression and no end. Adventure consists of a series of the same moves Propp found in the folktale, but there is no story development, which is one of the main characteristics of the folktale.

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The lack of a beginning and an end, or in Proppian structural terms an encompassing "function set," is also the reason Adventure cannot be considered a quest or a romance. Patricia Parker describes the main characteristic of romances as "a form which simultaneously quests for and postpones a particular end, objective, or object..."[60]

There are also superficial similarities between the dramatis personae and abstract style of folktales and those of Adventure. In both types of work we are told very little about the characters; at the most one or two things that characterize them. We only know what they do. "Die Personen weisen sich nur durch ihre Handlungsweise aus, wobei jede auf eine oder hoechstens zwei Eigenschaften festgelegt wird."[61] The abstract style of fairy tales is a result, according to Luethi, of the precision in the story development, the one-dimensionality of the fictional world, and the flatness of characterizations.[62]

The difference between Adventure and fairy tales does not lie in the structure, style, or in the subject matter, but rather in the ultimate goal these technical aspects of storytelling serve: the meaning to be imparted. Even as children, most of us knew that fairy tales have a message. They deal with their own definitions of right and wrong, good and evil, ugliness and beauty. As Jolles puts it, fairy tales have to do with an action-based ethic or a naive morality ("die Ethik des Geschehens oder die naive Moral).[63] Folktales are perhaps the most refined archetypal

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literary form of sublimation.

The symbolic style, typical characters, and straightforward plot are archetypal; they can stand for many different people or types of people, personality qualities, roles, common human experiences, and personal relationships. Bruno Bettelheim writes: "It is characteristic of fairy tales to state an existential dilemma briefly and pointedly ... The fairy tale simplifies all situations. Its figures are clearly drawn, and details, unless very important, are eliminated. All characters are typical rather than unique."[64] Luethi emphasizes the sublimation in folktales of hatred, love, helpfulness and cruelty, self-sacrifice and elimination; all the elements of human existence. He sums up: "Im Maerchen sublimiert sich die Welt."[65]

The underlying source of the narrative weaknesses in Adventure is its lack of meaning. The characters the reader encounters in the fictional underworld have no significance other than to pose a puzzle for the reader. While the characters in folktales are archetypes and abstractions of human emotion, consciousness and unconsciousness, the figures in Adventure are signs which replace the folktale's universal symbols. Some of the fragmentary functions in Adventure can be traced back to this. For example, in a folktale, a dwarf might personify some archetypal, unconscious human experience. If one of these symbolic characters opposed the hero (villainy), the hero would remedy the situation by defeating the villain (victory), usually by the same means the villain

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used in the first place. But when the pirate steals the reader's treasure in Adventure, the reader regains it by finding it.[66] The triumph and revenge aspect is missing entirely. The reader has little emotional involvement with the characters because they, in turn, do not represent any emotional or spiritual facets of human existence. As far as the reader is concerned, they are positive or negative figures, not folktale-like characters who represent some particular force in the psychological struggle for personal evolvement.

The main function pair of a folktale (villainy/victory or lack/lack liquidated) is the structure through which some type of personal or emotional development can be expressed. The development that takes place on the surface of folktales, and rendered through the fictional events, is representative of some type of symbolic development, usually from a state of lacking something or having been victimized to a state of having what was formerly missing or having "justice" carried out. There is movement from one state to another, better state. As Bettelheim remarks: "...fairy stories represent in imaginative form what the process of healthy human development consists of..."[67] Although Adventure shares many of the same structures it cannot be classi-

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fied as a folktale. What Underlying Set of Conventions Do the Structural Elements Support?

In Adventure, the structural elements and character functions Propp described in folktales are the narrative representation of the IF-THEN statements in the computer program. Instead of depicting the dynamics of personal struggle and growth, as in the folktale, each structural pair provides either the clue or a reward to a particular puzzle. The individual characters, situations, and choices are not based on any unifying idea or system of "rules" about good and evil, nor do the treasures symbolize emotional values or the rewards to be gained through personal development.

In folktales, for example, it is common for the protagonist to spare an animal (s)he meets and be rewarded when the animal helps the protagonist out of gratitude. One psychological interpretation for this could be that the animal symbolizes some instinctive force of one's personality or a emotional drives. By befriending the beast, i.e. viewing these initially frightening or rejected parts of one's personality not as enemies to be repressed or maimed, the drive can prove itself to be a useful and positive force in one's life. In Adventure, the only question the reader must ask him or herself is whether a creature is threatening or not. If it seems frightening, the reader must overcome it or appease it in some way, yet even in the case of an ugly, threatening figure, it is not clear whether there is

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any criteria for distinguishing between an animal to be killed or one the reader should appease. Even when the creature is not harrassing the reader, sometimes it must be killed, as in the case, for example, of the sleeping dragon. Instead of depicting the dynamics of personal struggle and growth, each structural pair provides either the clue or a reward to a particular puzzle, and the ethical basis of the clues is not consistent.

However, only one of the readers I have interviewed said he knew the game was not morally grounded when he first started playing Adventure. He is the only one who played Adventure strictly as a game. All others assumed it had a conventional moral basis, because reading Adventure is so similar to reading other stories. In general, readers considered the ethical implications of their actions much more in their opening attempts at playing than in their later attempts. For example, they were much less likely to "kill first, ask questions later," i.e. try other, non-violent solutions. The more they played, though, the more they treated the creatures as stick figures without an ethical, moral relationshp to the player.

When a reader starts playing Adventure (s)he must make sense out of the surroundings. Part of this is figuring out his or her own relationship to the entities and objects (s)he encounters. (S)he interprets events and makes choices constantly, and in order to do so, creates a fantasy about what the game means. Each time (s)he encounters a new

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puzzle, it is like an experiment providing another opportunity to confirm, reject, or revise the interpretation. Reading a detective story is a somewhat similar process, except that readers only know whether their interpretation of the literal events was correct at the end of the book, instead of step by step, and they can never be sure if they have correctly interpreted the deeper meanings.

With interactive fiction, at least readers have objective criteria for judging whether their interpretation is not incorrect, even if they don't always change their interpretation if it is proven to be incorrect. I have used the phrase "not incorrect" as something different than "correct." A reader can give the correct answer to a problem, but the logic and fantasy behind their conclusion can be all wrong. For example, one reader interpreted her adventure as entering a cave which all the creatures inhabited and she was an intruder. It was her duty not to disturb the creatures if possible. She therefore assumed that the purpose of the wicker cage was to catch and cage any cave creature she didn't want to kill outright, a hypothesis which seemed to be confirmed for her when she could cage the bird without killing it. Based on this assumption, she later tried to cage the snake and the dwarf, as well.

Although there is no moral basis to the prompt text or to the solution of the narrative puzzles themselves, there is a principle of action the reader practices in the process of reading that can be useful when carried over into

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the real world, i.e. reality testing. While playing Adventure, readers test their interpretation of the story and events many times over. If they can't solve a puzzle (which is the state people are in much of the time they are playing), they must face the fact that they don't have enough information, that they overlooked or misjudged the information they do have, or that their general view of the story might be wrong. Again and again they must consciously review precisely what they think, why they think it, and search for alternative ways to interpret the situation. Therefore, even as readers are totally involved and making choices, they must maintain a critical attitude toward themselves and the fictional situations they confront. This contradicts the ethics of events in folktales.

The same character functions that serve to "represent in imaginative form what the process of healthy human development consists of" in fairy tales can also be used in the conflict presentation/solution process in interactive fiction which can lead to an examination of one's own attitude toward problems in life. The case of the woman who tried to cage every creature she met in Adventure, including the dwarf throwing axes and knives at her is an example. After it became apparent that she would try negotiating with the animals, avoiding them, appeasing them, feeding them -- anything but kill them, even when they were attacking her -- she and her playing partner had a philosophical argument as to the validity of her attitude. He

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insisted that she throw the axe at the dwarf, and she insisted variously that "there is good in every creature," "do unto others as you would have them do unto you," and "of course it's justified in trying to kill us, we're enfringing on its territory." The dwarf then killed them, they were reincarnated, attacked by the dwarf again, she tried a few more non-violent tactics and was killed a second time. At this point she observed that she guessed the same thing happens to her in real life. She always tries to see only the good in people and then they dump on her. Whether she will draw any real-life consequences from this observation is another question, but she did modify her game-strategy. She refused to drop either the axe or the cage, but she did kill dwarves on sight. She no longer tried talking to them or caging them first. There is, then an underlying set of conventions in Adventure that is analogous in some sense to the moral underpinings of folktales, but it is the process of decision- making based on self examination and motive analysis the reader undergoes while solving problems, not the depicted actions and events in the story.

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FOOTNOTES: A STRUCTURAL ANALYSIS OF "ADVENTURE"

1. Vladimir Propp, The Morphology of the Folktale, trans., Laurence Scott (Austin and London: University of Texas Press, 1977).

2. Propp, The Morphology of the Folktale, pp. 20-21.

3. Propp, The Morphology of the Folktale, p. 21.

4. Propp, The Morphology of the Folktale, p. 35-36, 53-55.

5. Propp, The Morphology of the Folktale, p. 53.

6. Propp, The Morphology of the Folktale, p. 30.

7. Propp, The Morphology of the Folktale, p. 39.

8. Propp, The Morphology of the Folktale, p. 43.

9. Propp, The Morphology of the Folktale, p. 51.

10. Propp, The Morphology of the Folktale, p. 53.

11. Propp, The Morphology of the Folktale, p. 55.

12. Propp, The Morphology of the Folktale, p. 30.

13. The Morphology of the Folktale, p. 30.

14. For an overview of definitions of the folktale genre, see: Max Lüthi, Marchen, Sammllung Metzler Vol. 16 (Stuttgart: J.B. Metzlersche Verlagsbuchhandlung, 1974), pp. 1-4.

15. Webster's New World Dictionary of the American Language, David B. Guralnik, ed., Concise Edition (Cleveland and New York: The World Publishing Co., 1964), p. 828.

16. Max Lüthi, Marchen, p. 31.

17. Propp, The Morphology of the Folktale, p. 31.

18. Propp, The Morphology of the Folktale, p. 31.

19. Propp, The Morphology of the Folktale, p. 33.

20. Propp, The Morphology of the Folktale, p. 33.

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22. Propp, The Morphology of the Folktale, p. 35.
23. Propp, The Morphology of the Folktale, p. 36.
24. Propp, The Morphology of the Folktale, p. 39.
25. Propp, The Morphology of the Folktale, p. 39.
26. Adventure, ll. 1259, 1312.
27. Adventure, ll. 1588-1589.
28. Propp, The Morphology of the Folktale, p. 43.
29. Propp, The Morphology of the Folktale, p. 44.
30. Propp, The Morphology of the Folktale, p. 44.
31. Propp, The Morphology of the Folktale, p. 45.
32. Propp, The Morphology of the Folktale, p. 51.
33. Propp, The Morphology of the Folktale, p. 53.
34. Adventure, l. 1566-1167.
35. Propp, The Morphology of the Folktale, p. 53.
36. Propp, The Morphology of the Folktale, p. 53
37. Adventure, ll. 173-175; 1295.
38. Adventure, ll. 171-172; 1189.
39. Propp, The Morphology of the Folktale, p. 54.
40. Propp, The Morphology of the Folktale, p. 54.
41. Propp, The Morphology of the Folktale, p. 54.
42. Adventure, ll. 1183-1184.
43. Propp, The Morphology of the Folktale, p. 55.
44. Adventure, ll. 1312-1313.
45. Adventure, ll. 1588-1589.
46. Propp, The Morphology of the Folktale, p. 55.
47. Adventure, l. 1451.
48. Theresa Poser, Das Volksmaerchen: Theorie,

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Analyse, Didaktik (Muenchen: R. Oldenbourg Verlag, 1980), pp. 18-19.

49. Adventure, ll. 1335; 1532-1534.

50. Adventure, l. 1356.

51. Adventure, ll. 1527-1529.

52. Adventure, ll. 1451-1457; 1458-1461; 1462-1464.

53. "Plugh," or "xyzzy," for example.

54. Adventure, ll. 1462-1464.

55. Propp, The Morphology of the Folktale, pp. 71-73.

56. Propp, The Morphology of the Folktale, p. 70.

57. Adventure, ll. 323; 1336.

58. Adventure, ll. 1264-1265.

59. Adventure, ll. 1269-1270.

60. Patricia Parker, Inescapable Romance: Studies in the Poetics of a Mode, (Princeton, New Jersey: Princeton University Press, 1979), p. 4.

61. Poser, Das Volksmaerchen: Theorie, Analyse, Didaktik, p. 16.

62. Lüthi, Maerchen, pp. 32-34; and Lüthi, Es war einmal...: Vom Wesen des Volksmaerchens, (Gottingen: Vandenhoeck and Ruprecht, 1968), pp. 31-41.

63. Andre Jolles, Einfache Formen: Legende, Sage, Mythe, Ratsel, Spruch, Kasus, Memorabile, Marchen, Witz (Tübingen: Max Niemeyer Verlag, 1965), p. 240.

64. Bruno Bettelheim, The Uses of Enchantment: The Meaning and Importance of Fairy Tales, (New York: Vintage Books, 1977), p. 8.

65. Max Luethi, So leben sie noch heute: Betrachtungen zum Volksmaerchen (Goettingen: Vandenhoeck and Ruprecht, 1976), pp. 33.

66. Adventure, l. 1287.

67. Bettelheim, The Uses of Enchantment, p. 12.

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POINT OF VIEW IN ADVENTURE

For most readers, the way Adventure is narrated, the way the story is transmitted seems to be something completely new. In Adventure, the reader has become one of the characters, even the protagonist. Not only is the story about what happens to the reader, the reader is the one who makes the story happen, not the one who is the ultimate recipient of the story. In traditional literature the reader acquires the story, he or she actively takes in the story and identifies with the characters, but certainly doesn't take any part in creating it. Also, the reader of literary prose fiction is not the one responsible in the text for criticizing the action or the characters.

Letting the story tell itself through character-narrators is a modern development. As Joseph Warren Beach observes, one of the techniques Henry James used is the following:

> "...the story tells itself; the story speaks for itself. The author does not apologize for his characters; he does not even tell us what they do but has them tell us, themselves. Above all, he has them tell us what they think, what they feel, what impressions beat in on their minds from the situations in which they find themselves."[1]

Especially during the Victorian period, narrating the story was the task of the author, who interpolated events in the story with his or her own comments. The following examples are intended to illustrate such authorial interference. They

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are taken from Charles Dickens's Hard Times.[2] The narrator makes his point by rendering a scene from the M'Choakumchild school, mostly through quoting the characters' conversations with each other.

> "Girl number twenty," said the gentleman [the schoomaster, Mr. M'Choakumchild], smiling in the calm strength of knowledge.
> Sissy blushed, and stood up.
> "So you would carpet your room -- or your husband's room, if you were a grown woman, and had a husband -- with representations of flowers, would you," said the gentleman. 'Why would you?'
> "If you please, sir, I am very fond of flowers," returned the girl.
> "And is that why you would put tables and chairs upon them, and have people walking over them with heavy boots?"
> "It wouldn't hurt them, sir. They wouldn't crush and wither if you please, sir. They would be the pictures of what was very pretty and pleasant, and I would fancy --" "Ay, ay, ay! But you mustn't fancy," cried the gentleman, quite elated by coming so happily to his point. "That's it! You are never to fancy."
> "You are not, Cecilia Jupe," Thomas Gradgrind solemnly repeated, "to do anything of that kind."
> "Fact, fact, fact!" said the gentleman. And "Fact, fact, fact!" repeated Thomas Gradgrind.
> "You are to be in all things regulated and governed," said the gentleman, "by fact. We hope to have, before long, a board of fact, a people of fact, and of nothing but fact. You must discard the word Fancy altogether."[3]

This type of dialogue is not naturalistic and seems quite heavyhanded to us. The story is not being told through the eyes of the characters, but rather, the author speaks his ideas through their mouths.

In the first sentence of the next example, the narrator is still describing the events from a certain distance, although he does express his feelings in the somewhat

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sarcastic remark within the parentheses. But by the second sentence, the narrator switches the point of view and openly gives vent to his own interpretation:

> He knew all about all the Water Sheds of all the world (whatever they are), and all the histories of all the peoples, and all the names of all the rivers and mountains, and all the productions, manners, and customs of all the countries, and all their boundaries and bearings on the two and thirty points of the compass. Ah, rather overdone, M'Choakumchild. If he had only learnt a little less, how infinitely better he might have taught much more![4]

A later development in narrative technique was to present this information directly. The story was told not only in the words of the characters, but as if seen through their eyes. The author depicted the events in such a way that the reader would be given enough details to "intuitively" be able to judge it and understand the atmosphere for him or herself. The next example is taken from Lolita, by Nabokov. The narrator-protagonist, Humbert Humbert, meets Lolita again after he has lost her for several years. As readers, we feel as if we are looking at her through Humbert's eyes, feeling and thinking Humbert's thoughts, as if we are inside Humbert's mind:

> Couple of inches taller. Pink-rimmed glasses. New, heaped-up hairdo, new ears. How simple! The moment, the death I had kept conjuring up for three years was as simple as a bit of dry wood. She was frankly and hugely pregnant. Her head looked smaller (only two seconds had passed really, but let me give them a much wooden duration as life can stand), and her pale-freckled cheeks were hollowed, and her bare shins and arms had lost all their tan,

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so that the little hairs showed. [5]

In interactive fiction, the story is no longer depicted through the eyes of one of the characters; indeed, some of the story events are not depicted at all! In interactive fiction, there is a gap in the story: the narrator only describes the scene around the reader-protagonist, and the reader must decide what to make the story do next. The reader takes over some important functions of the narrator in traditional literature.

There are a few cases in Adventure in which the narrator actually does comment on the action, but this is always a matter of humor. In these cases the narrator seems to mock the reader's choice. The humor is based on the reader's uncertainty concerning the narrator's role, and derives from the discrepancy between the reader's emotional impression that the narrator knows what the reader is doing as if it were a human, and the reader's intellectual knowledge that the narrator is just a set of computer prompts. The programmer/writer predicted the readers' responses far in advance and programmed the computer's responses accordingly. The reader has been out-foxed by the programmer, not by the narrator. For example, if the reader types in various commands that seem obvious to humans but which the computer does not understand, the narrator seems stupid. When the reader then types in something (s)he assumes the computer won't understand (such as an obscenity

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or "get lost!"), but it responds as if it does (for example, "Watch it!" or "I'm as confused as you!"[6]), the effect can be startling and funny.

For most readers the way Adventure is narrated, i.e. the way the story is transmitted is quite novel. Only part of the story is narrated, i.e. the situation and presentation of the conflict; the reader is responsible for making up the resolutions to the conflicts and for deciding where to go in the cave. Until the computer, it has been impossible for the reader to have influence on a written text and be directly involved in changing a story. In interactive fiction, the interaction of the reader with the story through the narrator is admittedly somewhat primitive, but it is now possible; it does take place, whereas in printed literature it does not and cannot. Because there is no depicted protagonist, because the narrator does not actually render many of the main events and processes that lead to events in the story, and because the narrator serves in a completely different capacity from the narrators in "regular" literature, the point of view in Adventure is unlike any of the commonly recognized categories. It is one of the main things that differentiate interactive fiction from fixed-text fiction. In interactive fiction, both the narrator and the reader have new roles, and the historical trend towards having the story tell itself has been carried one step further.

In the next section, I will discuss this new way of

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presenting the story. First, I will give a short review of the concept of point of view, its historical development in fiction, and some of the ways that literary critics have dealt with it. Then I will analyse the point of view in Adventure and compare it to established catagories. I attempt to define some of the parts and the relationships in the point of view of Adventure by following Norman Friedman's strategy for defining point of view,[7] and answering some of the questions he posed about the narrator and the "adequate transmission of his story to the reader."[8]

Point of View and "Adventure"

When we talk about literature, "point of view" can refer to such varied aspects of the author's relationship to the story as the intellectual, or moral, or emotional orientation he or she expresses in the literary work. The most important meaning of point of view, however, has come to be that of "focus of narration," or the angle from which the story has been written.[9] This includes what Henry James called the "central intelligence"[10] governing the story--the person from which the story is told (such as first or third person), whether the central intelligence is conscious of itself or not, and whether it has an active role in the story. Point of view also refers to the distance the narrator has from the characters in the story, the author and the reader, as well as to the way the story has been told, in

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this case, the main distinctions are scene and summary.

From the works of the ancient Greeks to modern fiction, a trend towards the disappearance of the author can be traced, both in the use of scene and summary, as well as in the various types of distance an author can achieve through the choice made among different types of narrators.[11] This trend toward authorial extinction is carried one step further in interactive fiction such as Adventure. Aristotle differentiated between "imitation" and "simple narration."[12] If an author tried to speak through one of the characters, and assumed the language, thoughts and mannerisms of the character in order to tell the story, the author was telling the story directly, through the artistic device of imitation. Therefore, he considered the use of direct speech and dialog to be the purest forms of imitation. Passages of text written in indirect speech, in which the author was the one who told about the events of the story, he called "simple narration."

Through the Victorian period, the author did not disguise his or her comments; the author was part of the text: "...the trade mark of the Victorian novel is the presence of the author, ever poised to intrude a comment, to interpret the characters, or to write an essay on cabbages and kings."[13] It was at the turn of the twentieth century that the relation between the author, the narrator and the story subject became one of the predominant topics for critical evaluation. Henry James was obsessed with eliminating

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himself from the text. He believed that if a story could be told from the point of view of the consciousness of one of the characters in the story, the the story would gain in vividness, immediacy, and impact on the reader. Similarly, Percy Lubbock believed that artistic truth meant creating a compelling illusion of reality, and that the presence of the author in a story threw up an obstacle to this illusion:

> The art of fiction does not begin until the novelist thinks of his story as a matter to be shown, to be so exhibited that it will tell itself.[14]

Mark Schorer discussed another advantage in restricting the point of view to that of the characters instead of the author--"thematic definition."[15] In his opinion, by eliminating the author's voice from the story, he or she can achieve a better, more believable artistic definition of the values.

1) Who talks to the reader?

For the computer programmer/writer, the narrator in interactive fiction is simply a standard "oriented prompt," a message embedded in the program to the user that is displayed on the screen or typed out on the printer. To make the game Adventure more interesting, the programmers used one of the basic techniques of art: they gave the ideas and information contained in the prompts a shape. The prompts became part of a vaguely described entity endowed

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with some human-like characteristics and abilities. The authors don't speak to the game players directly -- they speak to them through this fictional being.

Whenever the reader begins the story-game from anew, (s)he is asked if they would like instructions. Included in these directions is the narrator's definition of itself, with a hint to the reader about the limitations of its understanding, its abilities and its role in the story/game.

> I will be your eyes and hands. Direct me with commands of 1 or 2 words. I should warn you that I look at only the first five letters of each word...I know of places, actions, and things. ...Usually people trying unsuccessfully to manipulate an object are attempting something beyond their (or my!) capabilities and should try a completely different tack.[16]

The reader's only connection with the Adventure story is through the narrator, yet each reader makes up his or her own mental image of who the narrator is. Although it speaks in the first person singular and functions as if it takes part in the story, it is not described as a character, or even as an independent being with a shape or personality. It defines itself in the introduction as an extension of the reader. It is described in terms of its role in the story--as the visual connection to the events in the tale ("I will be your eyes"), and as the reader's tool for manipulating the events and making things happen ("I will be your hands"). But the narrator/guide connects the reader to the story in ways that have not been explicitly stated when it

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was described in the introduction. The narrator not only functions as "hands and eyes," it expresses what on the surface appears to be emotion, has the rudiments of a personality, some very limited type of intelligence, and a voice. For the first time in printed literature, in other words, the narrator can not only speak to, but speak with the reader. As a result, different readers have very different impressions about who it is telling the story. Let me give some examples of the attributes I just mentioned. The first example shows the level of "conversation" the reader and narrator carry on.

Example 1:

N: Welcome to adventure!! Would you like instructions?
P: no
N: You are standing at the end of a road before a small brick buliding. Around you is a forest. A small stream flows out of the building and down a gully.
P: enter building[17]

One can infer from the statement that follows (in Example 2) that the narrator has some intelligence. Without prompting by the reader, it has not only spotted and analysed a problem, but extrapolated the possible future results if the problem is not remedied.

Example 2:

(The reader is in the cave but has not yet given the command to turn on the flashlight.)

N: It is now pitch dark. If you proceed you will

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likely fall into a pit.[18]

The two following excerpts should make it clear how readers can believe the narrator combines reasoning ability with emotional attitudes. Since the basic tone of speech expressed in such exchanges is fairly consistent, it is possible to deduce that the narrator has some type of personality:

Example 3:

N: You are in a long sloping corridor with ragged sharp walls.
There is an enormous clam here with its shell tightly closed.
P: take clam
N: OK
P: go south
N: You can't fit this five-foot clam through that little passage![19]

In the final example it even appears as if the narrator is conscious of itself. It speaks as if it knows itself and is insecure about some of its abilities:

Example 4:

P: throw axe (at attacking dwarf)
N: You attack a little dwarf, but he dodges out of the way.
One sharp nasty knife is thrown at you!
It gets you!
Oh dear, you seem to have gotten yourself killed. I might be able to help you out, but I've never really done this before. Do you want me to try to reincarnate you?
P: yes
N: All right. But don't blame me if something goes wr.....
--Poof!!--
You are engulfed in a cloud of orange smoke.
Coughing and gasping, you emerge from the smoke

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and find....
You're inside building.[20]

How do readers come to identify the narrator, since it is barely identified for them and is so very different from the narrators in printed literature with whom we are most familiar? From my conversations with other Adventure players, it seems that most readers' conception of the narrator is based on extrapolations of their experiences with technology, computers, and science fiction.

First, we all have some concept of the need for a mechanical intermediary to protect us in hostile environments. For example, we know we cannot live deep under water or in the upper atmosphere or outer space unless we use some sort of protective suits or cabins; in such environments we do not have direct access to our surroundings. In order to manipulate, interact with and sometimes even perceive these environments we use mechanical and electronic means, so the idea of indirect interaction with an environment through some non-human intermediary is not foreign to us. Also, although the narrator is described only conceptually in terms of its apperceptive and manipulative functions, most Adventure readers know enough about similarly functioning computer games and have been exposed to enough science fiction stories and movies to be able to fill in imaginary details. They give the narrator-entity some sort of shape in their minds.

Many readers consider the narrator in Adventure to

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be a cross between "HAL", the omniscient computer in "2001",[21] and ELIZA,[22] the computer program that simulates a psychiatrist. The computer in "2001" controls the space ship, i.e. it is the intermediary environment housing and protecting the humans from the environment of space. The narrator in Adventure serves in an analogous capacity: the reader cannot see or touch the Adventure world directly, and the narrator serves as the means of connecting the reader with the Adventure world, just as the computer-spaceship is the means in "2001" by which the humans can navigate through the "world" of outer space. The theme of humans' dependence on machines is common in sci-fi literature[23]; the average Adventure reader can draw on this background to help imagine what the narrator in Adventure might be like.

The analogy with ELIZA is even more direct. ELIZA is also just standard oriented prompts; yet people can talk to "her" and "she" (it) will answer in an apparently meaningful way. The experience of communicating with such a computer is analagous to talking on a telephone: just because you can't see the other person doesn't mean he or she is not there. Finally, there is a tendency in people to interpret inanimate objects that have anthropomorphic features as having feelings and to respond to the in the same way they would to people.[24] Some readers think about the narrator in Adventure in some of the same ways they do about people. They talk to it, they tell it to shut up, they thank it when they get a treasure, etc.

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Who, then, talks to the reader in Adventure? Whoever the reader believes it to be.

In interviewing Adventure players I was struck by the variety of their conceptions of the narrator's identity. Some readers considered it to be simply computer prompts indicating the current subroutine the computer was executing: for them the narrator was the author's thoughts and plans being executed and described. Some Dungeons and Dragons players considered the narrator to be the written instruction of the "Dungeon Master," i.e. the author guiding the game, while others told me they imagined they were talking to themselves, because the narrator identified itself as their own hands and eyes. Expanding on the idea of the narrator as the author's plan, other readers interpreted the prompts as the game presenting itself to them or as "the God of the Adventure world." They apparently meant a god who was similar to the the "Clockwork God" of the 18th century; i.e. as the laws of nature. Another interpretation was of the narrator as an imaginary or electronic character. Of the readers who viewed the narrator as a character in the story, some thought of it as a computer like the one in "2001," who controls the surrounding environment; others as an invisible stand-alone computer like R2-D2 of Star Wars,[25] accompanying them through a foreign world. Those who endowed it with varying degrees of feelings and personality considered it to be an android, like R2-D2's companion, 3-CPO.

Much of the story, we can see, takes part in the

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reader's head. Whether the the narrator should be considered the author's voice, their own mind's voice, the game itself, or some type of character -- a witness, a participant, one of the protagonists, or an antagonist -- depends in the end on the reader.

2) From what position regarding the story does the narrator tell it?

As Nick in The Great Gatsby,[26] the narrator in Adventure is a character who both observes events and takes part in them. Acting as the reader's eyes, it perceives and describes the cave and the reader's position in it:

> You are in a debris room filled with stuff washed in from the surface. A low wide passage with cobbles becomes plugged with mud and debris here, but an awkward canyon leads upward and west. A note on the wall says "magic word xyzzy".[27]
>
> You are in a splendid chamber thirty feet high. The walls are frozen rivers of orange stone. An awkward canyon and a good passage exit from east and west sides of the chamber.[28]

Yet, unlike Nick, the narrator in Adventure is always immediately in front of the action, observing every scene in the story and every event directly, as it is taking place. Although the character Nick is a witness of events and sometimes a participant in them, he does not take part in every aspect of the story, as does Adventure's narrator. Sometimes Nick is told by other characters in the story about events and their ramifications, including the effects

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they have on the mental and emotional states of characters.

The narrator does not tell the story from the position of the reader, either, inspite of its claim in the introduction of being an extension of the reader ("I will be your hands and eyes"). The narrator is the go-between for the reader in the imaginary cave environment he or she can neither see nor touch. Yet in the course of the story it must become clear to the reader that the narrator is a completely separate entity. It takes part in the action by carrying out the reader's commands, but it does not describe how it carries out the commands and it never uses the "we" form, even if it appears that the events should be happening to both reader and narrator since both are apparently moving through the cave together. It observes the actions of the reader with the same detached attitude as it observes the cave. The story, then, is told from the point of view of a robotic/computer, which is close to the events, observes the events, and even plays a role in the events, but which is totally unaffected by them.

How much does the narrator know?

How much does this narrator, the reader's guide and body, actually know about the story? Omniscient narrators have access to many different types of information: thoughts and feelings of characters (and sometimes even of the author), being able to view the story from many different angles, shifting the point of view from one character to

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another or from one angle to another. The narrator appears to know the entire story from beginning to end, but chooses what portions of that story it will reveal to the reader at what point in time. Friedman refers to narrators who are characters in the story as '"I" as Witness' narrators. The author "hands his job completely over to another"[29] and does not have any direct voice in communicating the story at all. "The witness-narrator is a character on his own right within the story itself, more or less involved in the action, more or less acquainted with its chief personages, who speaks to the reader in the first person."[30] Because of this, the witness-narrator should only know what the character would know; the character who serves as narrator can only tell about thoughts, feelings, and perceptions that the character could plausibly possess. Friedman calls this telling the story from the "wandering periphery."[31] The protagonist in the story can also serve as narrator. The same logic applies as when the story is told from the point of view of a character who witnesses the story -- the protagonist-narrator can only describe its own thoughts, feelings, and perceptions; it sources of information must be limited to those the protagonist in he story would have access to if the story were taking place in real life. In Selective Omniscience, ostensibly there is no narrator at all. The events are related as if they were in the process of going through the mind of the character. "Instead, therefore, of being allowed a composite of viewing angles, (the reader) is

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at the fixed center."[32] The final narrator-category of importance in determining the nature of the narrator in Adventure Friedman calls "The Camera."[33] For him, this point of view appears to be the ultimate form of authorial exclusion. Here, the story is told as a series of events as if they were recorded by a mechanical medium, as if there were no selection or arrangement or shaping of a story. It is as if there was no interpretation of the story, no selection of what is important, no arrangement of the actions to exemplify or reify meaning. The recording medium perceives events as they come within its means of perception. Its function is to "transmit unaltered a slice of life."[34]

At first glance, it would seem as if the narrator-guide in Adventure does not know everything about the story. But scrutinizing the narrator's role and comments more carefully reveals certain discrepencies. In describing things to the reader, it always picks out only the most important things in the cave. It is selective and seems to have evaluated the objects and pathways around it; it does not give the reader any extraneous information. This suggests a knowledge of the cave that a true mechanical guide could not have, or could only have if it had been through the cave before and "knew" the cave, yet if the reader asks the guide about some other part of the cave not immediately in front of it, for example, "Find water," it says "I can only tell you what you see as you move about and manipulate things. I cannot tell you where remote things are."[35] The guide

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evidently does have some sort of memory of past events; it keeps track of objects the explorer needs, such as food and water, and it would seem to have enough intelligence to be able to make a judgement about the future: "You'd best start wrapping this up soon."[36]

The narrator in Adventure is similar in some ways to the "Camera" narrator Friedman discusses, but much more complicated. It carries out commands given by the reader. Without informing the reader how it completes tasks, on command it opens locks, picks up and drops objects, aims and throws axes at the attacking dwarfs, moves the reader through the cave, keeps an inventory of objects it carries for the reader, etc. This suggest that it has a memory and the very least is capable of complex calculations. It is inanimate, like a robot with no feelings or mental states that are part of the story to be told. Yet, unlike the "Camera," this robotoid narrator does take an active part in the story. The reader sees the cave through the eyes of the narrator and manipulates the objects in the cave to make things happen through the narrator. The narrator has many of the same functions as the robot-computer of "2001": it can not only see, but see ahead, i.e. predict results that will take place in the future if a course of action taking place in the present should continue.

> You're in cobble crawl. It is now pitch dark. If you proceed you will likely fall into a pit.[37]

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3) What channels of information does the narrator use to convey the story to the reader?

The main types of information the narrator uses to transmit the story are sensory: mostly visual, but also acoustical and tactile. Most information corresponds to what a person would see, hear, or feel in the described situation. The excerpts below illustrate how this sensory information is commonly expressed in Adventure.

> You are at a complex junction. A low hands and knees passage from the north joins a higher crawl from the east to make a walking passage going west ...
> The air is damp here.[38]

> You are in a magnificent cavern with a rushing stream, which cascades over a sparkling waterfall into a roaring whirlpool which disappers through a hole in the floor. ...[39]

The reader needs this information to know where he or she is in the cave. Most of the story units give information for the reader to orient themselves spatially like this, but there is also a temporal aspect to the tale: time = moves. The narrator keeps track of the reader's supplies such as food, water, and light, and compares them to how many moves the reader has made. This is equated to the supposed time the reader has spent in the cave. It warns the reader, who must then leave the cave, solve the problem, or "die":

> Your lamp is getting dim. You'd best start wrapping this up, unless you can find some fresh batteries.

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> I seem to recall there's a vending machine in the maze. Bring some coins with you.[40]

However, the narrator apparently has access to a much wider range of knowledge about the Adventure world than what it (or the reader) could logically see, hear, or feel. Examine the next excerpts:

> You are in the softroom. The walls are covered with heavy curtains, the floor with a thick pile carpet. Moss covers the ceiling.
> A small velvet pillow lies on the floor.[41]

> This is the oriental room. Ancient oriental cave drawings cover the walls. ...
> There is a delicate, precious, Ming vase here![42]

How did the narrator know enough to be able to identify things it had never seen and places it had never been before? How did it know about the nature of the softroom, i.e. its softness, and why did it tell the reader instead of letting the reader come to his or her own conclusion about the nature of the room? In the examples above, "soft" is a hint to solving the problem of dropping the Ming Vase treasure in the building without it breaking. The solution is to first drop the velvet pillow, then to drop the vase on the velvet pillow. (Note: The narrator only understands the word "drop," not words like "carefully place" or "put.")

Even more astonishing is the narrator's ability to bring "dead" readers back to life:

> (The reader has fallen into a pit, broken every bone

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in his or her body, and is dead.)

N: Do you want me to reincarnate you?
P: yes
N: All right. But don't blame me if something goes wr.....
--- Poof! --- You are engulfed in a cloud of orange smoke. Coughing and gasping, you emerge from the smoke ...[43]

It would appear that only an omniscient author could know where it is in the cave without having been there before, and select what turns out to be information the reader will need later to solve some puzzle. Omniscient narrators don't need to explain how they know or do things; they just do. They also don't need to justify their ability to raise the dead. The readers who consider the narrator to be the thoughts, words, and feelings of an author who is limited by technical constraints to short prompts feel that Adventure is written from the point of view of an omniscient narrator. The channels of information used to convey the story to the reader are consistent with an omniscient narrator, whether that narrator is the author, or a set of computer prompts that simply display which part of the program it is in at any given point, or the "God of the Adventure game," or the game itself talking to the reader.

However, many readers do not see it that way. The channels of information used to communicate the story to the reader can also be interpreted as those of a narrator with limitations. If the reader considers the narrator to be a character, then the channels of information are those of some type of electronic guide with visual, aural, and

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tactile sensors, who has either been through the cave before, or has been programmed to recognize and interpret certain data. There have been enough sci-fi and fantasy stories and films about bionic people to even make the idea of a reincarnation through super-sophisticated technology (or magic!) seem conceivable. Judging by the information given, it is impossible to distinguish whether the narrator is an omniscient author or merely a character in the story.

If one reads Adventure like one reads "normal" literature, then the narrating-prompts act as a character, a character who not only observes the situations and actions, but also takes part in them. The role it plays is that of robotic guide through a cave that humans cannot perceive for themselves. The types of information used to transmit the story are those of a robot which can see and touch the world around it, an electro-mechanical being which interprets the sensory data it receives for the human it is guiding, and which carries out the human's commands, although it couldn't care less about either the human or the results.

From around the time of Henry James to the present, writers have been concerned with "finding a centre," a "focus" for their stories. One solution was to limit the narrative vehicle by "framing the action inside the consciousness of one of the characters within the plot itself."[44] Assuming that the reader considers the narrator to be some type of being, then the part of the story that is depicted is narrated by a character in the story.

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Almost by accident, it seems, the unsophisicated computer programmers/writers of Adventure have been able to limit the narrative vehicle as well as they have without being consciously concerned with doing so. Part of their success in this technical aspect of presenting the story is due to the presumed limitations of an electronic or mechanical, robot-like narrator. Unlike a human narrator, who presumably has a heart and soul, the mental or emotional states of an inanimate narrator have to be dealt with in a manner commensurate with their existence, i.e. minimally, if at all. In other words, the writers have, by default, come up with a limited narrative vehicle.

In Adventure, the story does "tell itself;" the reader does find out only that type of infomation from the narrator to which either an omniscient author-narrator or a character-narrator (some type of electronic guide) could conceivably have access. Acting as the interface between the Adventure world and the reader, the narrator tells what it sees and knows. Although the way it expresses itself simulates peevishness and fussiness at times, this is the only emotion it imitates. Otherwise, it has no detectable feelings, so none are depicted in Adventure; any emotions raised in Adventure are located in one character only -- the reader. As such, they remain undepicted, though not necessarily unexpressed. Adventure is such a gripping tale that many reader-players find it impossible to read silently. They often groan, moan, whoop in elation, and talk to or

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yell at the computer.

4) At what distance does the narrator place the reader from the story?

The answer to this final question, of the reader's distance from the story ("near, far, or shifting") is: never has the reader been so close to the story. One of the most captivating aspects of Adventure is the immediacy of the story: for the first time in printed literature, it is possible for the basic temporal state of the story to be the continuous present. The narrator depicts the scenes and events in the cave either as they are in the process of happening or immediately after they have taken place. The following excerpt should illustrate how interactive fiction leads to a greater sense of "real-time" action:

> N: There is a tiny little plant in the pit, murmuring "water, water, ..."
> P: pour water
> N: The plant spurts into furious growth for a few seconds.
> You're in west pit.
> There is a 12-foot-tall beanstalk stretching up out of the pit, bellowing "water!! water!!"[45]

The reader not only observes scenes and events through the narrator as in "regular" literature, but can also have an influence on them, change them, manipulate them. In the above example, if the reader had not poured water on the plant, nothing would have changed; no matter how often he or she returned to west pit, no matter how long

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he or she stayed there, the little plant would have continued murmuring "water, water" and stayed its same size. Although Adventure is a printed text, it is not a fixed text and without the reader's participation, the story would simply not progress. All the narrator does is to present the reader with situations and carry out the reader's instructions to it if it is able. In some sense, it is the reader who determines what the narrator sees, since the reader decides where to go in the cave. Although the readers' reactions to events, their mental and emotional states and responses, and the logic they used to solve the problems are not depicted, they are an integral part of what happens in Adventure; nothing would take place without the reader's active involvement; without them there would be no story. The reader is closer to the story than ever before.

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FOOTNOTES: POINT OF VIEW IN "ADVENTURE"

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3. Dickens, Hard Times, pp. 51-52

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13. Aristoteles, The Poetics, tras. W. Hamilton Fyfe (Cambridge: Harvard University Press, 1927), pp. 23, 95.

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16. Adventure, ll. 1318; 1319; 1387; 1398-1401.

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26. F. Scott Fitzgerald, The Great Gatsby (New York: Charles Scribner's Sons, 1925).

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28. Adventure, ll. 25-27.

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32. Friedman, "Point of View in Fiction," in: Stevick, Theory of the Novel, p. 128.

33. Friedman, "Point of View in Fiction," in: Stevick, Theory of the Novel, p. 130-131.

34. Friedman, "Point of View in Fiction," in: Stevick, Theory of the Novel, p. 130.

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35. Adventure, ll. 1416-1417.

36. Adventure, ll. 1626-1627.

37. Adventure, ll. 312; 1346.

38. Adventure, ll. 112-114.

39. Adventure, ll. 168-170.

40. Adventure, ll. 1612-1614.

41. Adventure, ll. 171-172; 1189.

42. Adventure, ll. 173-174; 1295.

43. Adventure, ll. 1452-1457.

44. Friedman, "Point of View in Fiction," in: Theory of the Novel, p. 112.

45. Adventure, ll. 1219; 1220; 322; 1221-1222.

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READER RESPONSE

In the opening chapters of this dissertation the emphasis was on Adventure's affinities with traditional literature. First, the close relationship between play, games, and literature was explored. A discussion of the traditional literary models and narrative strategies that are used in its story followed. A comparison was made between Adventure, the first major literary work of the new computer medium, and the sixteenth century prose Novels of Chivalry and Adventure, particularly Amadis of Gaul, whose propagation came to be closely tied to the then new technology of the printing press.

The fluid nature of the computer narrative created as Adventure is played has important ramifications for the function and construction of the text, as well as the role of the reader. Therefore, in the section on the narrator and point of view in Adventure, I began a refocus of attention from Adventure's similarities to traditional literary models and techniques toward some of its differences. The narrator in Adventure acts as some type of character in the story, but has access only to that part of the story the reader directly activates. The narrator actually interacts verbally with the reader, responding to his or her commands to manipulate objects or move through the cave. In a sense, then, the text communicates with the reader through the narrator. (This idea is summed up nicely, I think, in a

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message joke I saw displayed on screen, a UNIX "fortune cookie" that went something like this: "Ours is a strange relationship, for you are a person, whereas I am only a sentence.")

In this chapter I will examine one of the major differences between conventional and interactive fiction: the role of the reader. The emphasis will be on the consequences of the reader's physically and imaginatively creating part of the written text and deciding where (s)he wants to go in the cave, which objects to pick up or drop, and how to solve the problems (s)he encounters. This changes the way the reader "reads" the text and re-casts the reader as the co-author of any interactive text. It also means that the interactive text cannot be exhaustively consumed, not even theoretically. I shall also discuss the "closed loop" nature of the reader's response to interactive fiction, and compare it to the open loop nature of the reader's response to conventional written fiction. Because interactive fiction represents the first closed loop system in printed literature (i.e. a system which includes a feedback mechanism), issues of authorial control and intention must be redefined vis-à-vis the traditional text.

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Textual Gaps

One of the critical issues in studies of reader response is what is not written in the text itself, ideas that the reader fills in. Wolfgang Iser calls these "blanks" or "gaps" in the text. "They (the blanks in the text) indicate that the different segments of the text are to be connected, even though the text itself does not say so. They are the unseen joints of the text, an as they mark off schemata and textual perspectives from one another, they simultaneously trigger acts of ideation on the reader's part."[1] Iser uses an image from The Figure in the Carpet by Henry James[2] to illustrate the concept.[3] In James's story, the meaning of a literary work is compared to the complex designs in a Persian carpet. The patterns consist not only in the presence of the designs themselves, but in the background or space surrounding and connecting various designs as well. According to Iser, meaning in a literary work is not only what is precisely formulated on the printed page; meaning can also be found in what is missing from the text. He believes meaning can only be grasped as an image, an image which provides the filling for what the textual pattern structures but leaves out.[4]

In the article "Interactive Fiction,"[5] Niesz and Holland observe that interactive fiction only superficially appears to fit Iser's model of reading. They observe:

The interactive reader is not limited but (as in any

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> text) free to respond in idiosyncratic or even bizarre ways ... the text simply provides materials which the reader has unlimited freedom to shape, edit, and assemble into an experience that is congenial to his own identity. The text then gives its own good, bad, or neutral feedback to the response the reader has brought to bear.[6]

I believe that the question of whether interactive fiction acts out Iser's model of reading is complicated and can not be answered in such a simple way. Iser's model does not apply to interactive fiction, but for reasons other than those Niesz and Holland suggest.

First, the blanks and gaps in the traditional and interactive texts are different in nature. When a segment of the interactive text is displayed on the screen it is followed by emptiness, which the reader can fill with his or her own physical textual input (based on an imaginative response to the text as the reader perceives it). This is not the same as the text segments and gaps in traditional literature. In the conventional text, all the text segments and the gaps between the segments exist at all times in the text. The reader can read all of the segments of text, even if they have not filled in the gaps in meaning. The reader does not even know for sure where or if there are gaps in the text, since they are not textually distinct. In interactive fiction, the reader cannot continue reading without interpreting the blanks as (s)he can in a conventional text. Also, in interactive fiction, at least the physical gaps in the texts are clearly marked. After a segment has been displayed on the screen, the computer waits

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for some type of reader input. The reader cannot simply read on and figure out what the missing link meant at some later point in the text.

Second, Niesz and Holland are correct in saying that as long as the reader types in any reply whatsoever, (s)he will always receive some type of counter-response from the computer. The reader's input does fill in a physical blank in the text, and leads both to the display of some new textual segment and the creation of a new textual blank. It does not mean, however, that the reader "has unlimited freedom to shape, edit, and assemble (the textual materials) into an experience that is congenial to his own identity." While a blank in the physical text can be filled by some bizarre reader input, the gap in meaning will not. This gap in meaning will be apparent to the reader, as the following Adventure script excerpt illustrates.

N: You are in a 20-foot depression floored with bare dirt. Set into the dirt is a strong steel grate mounted in concrete. A dry streambed leads into the depression. The grate is locked.
R: Unlock grate
N: The grate is now unlocked.
R: Drop keys
N: OK
R: South
N: You are in open forest, with a deep valley to one side. (The reader finds his way back to the slit.)
R: Go in.
N: I don't know in from out here. Use compass points or name something in the general direction you want to go. You're at slit in streambed. There are some keys on the ground here.
R: Go grate.
N: I don't know how to apply that word here.
R: West

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N: You're in forest. (Reader finds his way back to the slit, outside the grate.)
R: East
N: You're in forest. (Reader finds his way back to the slit again.)
R: Through grate.
N: I don't know that word.
R: Go down. (Finally, the reader enters the cave.)[7]

It is obvious that this reader was not satisfied with just any response to what he has typed in. Because he had to find his way back to the cave each time he went the wrong direction, this portion of text actually took him thirty-six moves instead of the nine I have depicted here. Repeatedly, he filled in the blanks in the text without completing the gap in meaning he perceived. Based on past experience of story and narrative structures as well as the conventions of playing Adventure, he knew it was highly probable that the author intended for the reader to unlock the grate with the keys he found in the building and enter the cave. He knew that he had not yet figured out and completed the specific blank the author placed in the text for the reader to fill. Unless readers solve the problems they face, parts of the text will be closed.

My own image of interactive fiction is of a Persian carpet which runs under a locked door into another room, and is therefore only partly visible. The narrative patterns or structures consist of the text produced by the computer and the blanks which are then filled in by the reader. In addition, the reader must also try to foresee or project the way the author must have intended the story patterns to

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continue. First, though, the reader must find the correct key to unlock each puzzle in order to complete the pattern (s)he perceived.

The Reader as Author

Stanley Fish, Wolfgang Iser, and Norman Holland all deal with the idea of the act of reading as readers "writing" texts.[8] What they mean by this is that the meaning in a literary work is not contained in the written text itself because a written text is only "marks on a page." The meaning of the marks on the page must be created by each reader in his or her own mind. Todorov pictures the relationship of author, text, and reader[9] thus:

1. The author's account
   ↓
2. The imaginary universe evoked by the author --> 3. The imaginary universe constructed by the reader
   ↑
4. The reader's account

He calls the difference between stage 2 and 3 as signification and symbolization.[10] Fictional events are signified by the words in the text (i.e. the events depicted in the text), but the implications of the events are symbolized. "Signified facts are understood: all we need is knowledge of the language in which the text is written. Symbolized facts are interpreted; and interpretations vary from one subject to another."[11]

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In interactive fiction, Todorov's chain of connections between the reader, the author, and the text form a closed loop. The gaps in the interactive text must be physically filled in by the reader, which in turn activates new portions of the author's imaginary world.

1. The author's account
   ↓
2. The imaginary universe evoked by the author <-- 5. The reader's text
   ↓ ↑
3. The imaginary universe constructed by the reader --> 4. The reader's account

I have emphasized repeatedly that the interactive text is neither fixed on pages nor organized by the author in the conventional linear fashion. In interactive fiction the author structures the story materials to be activated dynamically, not in a linear story form. Each aspect of the story -- objects that can be carried, vocabulary the program recognizes, locations, and treasures -- is contained in a separate program subroutine or data structure. The reader is the co-author of the interactive text because these story aspects are activated by his or her input. Within certain constraints, the reader chooses which objects to carry and where to go in the cave (etc.), so the program reconstitutes the story materials (which have been provided by the author) at each move in accordance with the reader's input, but the

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reader is in charge of assembling the story.

The re-constitution of story materials at the end of each narrative unit or move is not possible in a text that is fixed. As I described in the introduction, some attempts have been made to provide reader/text interaction in fixed-text books (for instance, the "Choose Your Own Adventure" or "You Are the Star" series). Such texts are tree-structured instead of linear, i.e. multiple pathways of story lines can branch from one single node. In a fixed text, it is possible to provide multiple story endings and plot options from which the reader can choose. For example, the children's "Choose Your Own Adventure" story, The Cave of Time,[12] has 56 unique stories. However, the reader can function at most as an editor who decides the sequence of the pre- formulated parts of the text, not as an author whose ideas about a story create new text.

The astronomical number of potential interactive texts a reader can create compared to those of fixed-text literature makes it qualitatively different from conventional literature. Because the interactive text is meant to be assembled step by step, it does not imply a particular reading; it is an infinitely plural, open text. Iser postulates an "implied reader"[13] of conventional literature and a text which "asks" to be read in a particular way: "The text provokes certain expectations which in turn we project onto the text in such a way that we reduce the polysemantic possibilities to a single interpretation in keeping with the

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expectations aroused, thus extracting an individual configurative meaning."[14] Even Fish, who believes that each reading experience is actually the "writing" of a new text argues against the "infinitely plural or open text."[15]

The great number of different texts that can be generated with Adventure results from the various permutations and combinations of manipulations of objects and from the many different sequences by which places in the cave can be encountered. Strictly speaking the number of different texts must be infinite, since it is possible to travel in repetitive loops within the cave and because (as Holland and Niesz point out)[16] the reader can type in any comment and elicit at least some response. However, a text containing great repetition or innumerable nonsense commands is likely to be quite boring, so one could reasonably argue that it is unfair to claim such an infinite range for Adventure. Even so, it is easy to demonstrate that, without resorting to repetitive loops and nonsense commands, the number of distinct possible texts is immense. I asked a scientist of my acquaintance to give me a more exact idea of how many possible texts there are in Adventure. This is what he had to say:

> As an illustrative example, consider just the "battery maze" in Adventure. There are only twelve different locations here, eleven of which are each connected to nine or ten of the others. For the sake of calculation, let us restrict the reader such that he or she passes through the entire maze from the outside to the battery chamber and back out again,

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> without ever entering the same location more than twice (once while entering and once while exiting). This eliminates the possibility of repetitive loops. To exclude nonsense commands we can impose the further restriction that only commands having to do with movement within the cave and the dropping of objects are allowed. Even within these rather restricted conditions, the number of different ways to experience the battery maze (and hence the number of unique texts) is 187 billion trillions or 186,777,870,000,000,000,000,000.
>
> To appreciate just how large this number is, assume that a fast typist with a good knowledge of the maze could move through all twelve locations, dropping objects along the way, within thirty seconds. For such a person to experience the battery maze exhaustively would require 197 trillion years, a period 13,000 times longer than the age of the universe. The inexhaustible nature of Adventure results not just from the limitation of the human lifespan, as one might have guessed, but also from such seemingly more generous constraints as the lifetime of the sun and the durability of the proton.[17]
>
> (See appendix for complete analysis)

Norman Holland has dealt with the way a reader's psychological make-up affects the interpretation of the conventional linear text. He writes: "Each reader recreates the original literary creation in terms of their own personalities."[18] Based on their interpretations, readers will "see" in the text almost exclusively what they want to see, or as Stanley Fish puts it: "The interpretation determines what will count as evidence for it, and the evidence is able to be picked out only because the interpretation has already been assumed."[19]

Regardless, however, of the number of independent interpretations there are of a given text, the linear or tree- structured text itself is permanent and unchanging. In interactive fiction, readers' interpretations of the

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story events taking place shape their succeeding responses and therefore shape the creation of the physical text, i.e. the marks on the page. Consider the following examples:

One reader believed the treasures in the cave were left by the good wizard of a long-vanished civilization. The cave had been taken over by the wicked dwarves and trolls. The goal of the story was to solve all the problems in the cave, after which the long-lost secrets of the noble civilization would be revealed and truth, justice, beauty and magic would reign again. (This fantasy appears to draw on themes from fantasy literature such as Lord of the Rings[20] or LaGuinn's Earth-Sea Trilogy).[21] The physical texts this reader created showed a variety of reading strategies, including entire games spent only in exploration, puzzle-solving, or acquisition.

Another reader, the camper-backpacker described earlier, imagined that careless spelunkers had left the treasures in the cave, much as she had experienced real-life careless campers leaving their garbage in the wilderness. She refused to see the creatures in the cave as evil; rather, they were a part of nature and merely defending their territory (much as a bear would in the real-life wilderness she loves). She played the game, i.e. created new texts, accordingly. Basically, she wanted to clean up the cave. She picked up everything she found and was reluctant to drop anything. This meant that if she came across a treasure, such as the pile of gold coins, she would leave it

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rather than drop the keys or food she was carrying. Hers was the only text I observed in which the birdcage was never dropped. The birdcage was the most important object in the cave for her, since she hoped to avoid killing animals by caging them. If she couldn't take the birdcage with her into one of the cave passages, she simply wouldn't go in that direction. Obviously, she created highly unusual, individualistic texts, texts that are not likely to be duplicated in their general form ever again by other readers.

Yet another reader interpreted taking the treasures in the cave as stealing them. This reader had had fantasies as a child of stealing the things she knew her parents could not buy. Stealing the treasures in the cave elicited both guilt and highly pleasurable feelings. From the texts she created, it was clear that each time this reader found a treasure, she would immediately retrace her steps, returning to the building as quickly as possible to deposit and thereby secure it. Scripts of her texts showed, for example, that she avoided the battery maze as long as possible. She was not interested in solving intricate problems, only in acquiring treasures.

Each of these readers picked out a different theme in Adventure, and each created a physical text on the screen that reflected his or her particular theme. Adventure can be read as a story of exploration, of acquisition, of attempts at communicating with the narrator, of revenge, or

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any other number of ways. In each of these readings, the reader will create a correspondingly different written text.

Stories and Supra-Stories

One of the most interesting things to have come out of interviewing so many readers was discovering just how wide a range of readings is possible with a dynamically created text such as Adventure. Literary critics have looked at the theoretical problems posed by variance in interpretations of texts for many years. Norman Holland accounts for the wide range and contradictory interpretations of texts as resulting from the intra-psychic dynamics of individual readers.[22] Stanley Fish uses the contradictory interpretations to support his contention that the literary experience should be studied, not only the literary text.[23]

In interactive fiction, the interpretations of the story events are so important and have such far-reaching effects on the reader's construction of the physical text that they take on a shape and quality of their own. The magnitude of their importance gives them a new dimension compared to Todorov's "reader's account" in conventional fiction. Because they are complete stories on their own and distinguishable from the physical text they are created to explain, I would like to give them a specific designation. I do this to distinguish them conceptually from the story or events expressed in the text itself. I call the events expressed in the text the story, and the reader's story in

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their minds explaining these events, the supra-story. Modifying Todorov's diagram cited above even further, I would like to change "the reader's account" to "the reader's supra-story":

1. The author's account
   ↓
2. The imaginary universe evoked by the author <-- 5. The reader's text
   ↓ ↑
3. The imaginary universe --> 4. The reader's supra-story

One supra-story can be the basis for readers writing many different texts. Using the examples above, the first reader's stories were the texts she created of exploring the cave, solving the puzzles, and acquiring the treasures. Her supra-story was the explanation that the treasures had been left by a good wizard of a long-vanished civilization which she could reinstate by solving all the problems in the cave. The second reader's stories were about collecting anything she could find in the cave and negotiating or trying to cage the cave creatures. The idea that bad spelunkers had left their junk in the cave and that the creatures in the cave were merely defending their territory was her supra-story.

The motivation that accounts for the creation of supra- stories which are 1. complete in themselves and 2. are more than the texts they elicit and from which they in

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turn are elicited, is the basic psychological drive to establish context.

Gregory Bateson based his famous "double-bind" theory on the idea that understanding of individual events, be they language, emotions, or relationships, only takes place within a given context.[24] If the message of the events contradicts the context, a double bind will occur. He writes that learning and experiencing occur "within a wider context -- a metacontext if you will -- and that this sequence of contexts is an open and conceivably infinite series ... what occurs within the narrow context ... will be affected by the wider context within which this smaller one has its being."[25]

Fish also uses the idea of context to explain the differences in interpretations of the same text. Events and language can only be understood within a situation. "There is never a time when assumptions are not in force."[26] He shows that no sentence, event or utterance is unambiguous, because they can never not be in context.[27] This is the basis of his assertion that what a reader sees in the text is a function not of what is "in the text" but of the reader's interpretive activities at a primary level, for interpretations are part of the context within which one reads a work.

The fact that interactive fiction seems to elicit the construction of highly individual contexts from readers more powerfully than does conventional fiction can be

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understood for the following reasons: Readers must make the text happen. They must find patterns in the fictional events, because the physical gaps in the text mean that the textual patterns are incomplete. They must make fairly sophisticated assumptions in order to hazard guesses about completing the text. Many readers get intensely, emotionally involved in the fictional events because of their step-by-step activity in exploring the fictional world and mastering the fictional events. This can unlock strong feelings and memories of associated events from their own lives which they then build into the imaginary world they are creating. Finally, the fictional events in Adventure, for example, are only minimally explained, i.e. there is little context provided for the reader by the author.

In this one sense, interactive fiction's quality of evoking emotionally charged and intellectually complete contexts for the text makes it more similar to the open textuality of lyrical poetry than the tightly woven textual fabric of fiction. In fiction at least the story on the surface is depicted in the text; the reader knows what happened because the fictional world is clearly laid out. This is not necessarily the case in lyrical poetry. Here the reader has to relate the metaphors, images, similes, and other rhetorical figures to his or her own experiences in order to figure out what the poem is even about. In lyrical poetry there are often as many blanks in the text as there are meanings.

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In the openness of the text, Adventure seems to have a rather poetic quality of making readers imagine much more for themselves than is usually required in reading fiction. In both interactive fiction and lyrical poetry, readers must make up their own stories and explanations for the fictional events.

Interactive fiction is unique in being a closed loop system of literature, as opposed to conventional, linear or tree- structured texts. Van Nostrand's Scientific Encyclopedia defines open and closed loop systems in the following fashion:

> A feedback loop or closed loop is a signal path which includes a forward path, a feedback path, and a summing point, and which forms a closed circuit. ... By contrast, an open loop or open-loop control may be defined as a single path without feedback. For example, a process or machine that is preprogrammed to function on a time basis and does not take into consideration continuous measurements of the end results as a criterion for adjusting the control system is open loop.[28]

Todorov's original diagram clearly depicts the open-loop nature of conventional literature. The reader's ideas and interpretations which have been elicited by the literary work have no effect on the literary work itself. In interactive fiction, though, the reader's interpretation forms the literary work. If a reader is reading Adventure as a story of exploration instead of one of acquisition, (s)he will only give the commands necessary to explore. The interactive text responds to a reader's feedback, therefore

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the reader and the interactive text form a closed loop system.

1. The author's account

↓

2. The imaginary universe evoked by the author <-- 5. The reader's text

↓ ↑

3. The imaginary universe constructed by the reader --> 4. The reader's account

As a closed loop system, the interactive text elicits, responds to, and is formed by the reader's feedback. As such, for the first time the reader has some means of checking whether (s)he has understood the author's intentions. If the reader doesn't read or understand the story at least roughly in the way the author intended, the story simply stops. Conversely, the reader's "correct" interpretation is rewarded by the elimination of obstacles, the acquisition of treasure, the freedom to move through the cave, etc. All of this is made possible by the fact that in interactive fiction, the way a reader responds to the text affects what comes next in the text.

The closed loop nature of interactive fiction means that both the author and the reader gain a new type of control over the text. The author exerts a measure of control over the reader's thinking and interpretation, because the

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story will stop if the reader doesn't type in commands for story possibilities the program allows and solve the problems in the way the author wishes. The reader gains control because (s)he can choose where to go in the cave and what to pick up, as well as whether (s)he will read the game and create corresponding texts of stories of acquisition, communication, or exploration.

The Scientific Method in the Process of Reading Interactive Fiction

One of the basic tenets of reader response theory is the idea that literary criticism should be the analysis of the readers' experience of a literary work. Wolfgang Iser observes: "Meaning is no longer an object to be described, but an effect to be experienced."[29] Fish also emphasizes the need to analyze readers' acts of interpretation:

> The meaning they (the reader's activities) have is a consequence of their not being empty; for they include the making and revising of assumptions, the rendering and regretting of judgments, the coming to and abandoning of conclusions, the giving and withdrawing of approval, the specifying of causes, the asking of questions, the supplying of answers, the solving of puzzles. In a word, these activities are interpretive -- rather than being preliminary to questions of value -- and because they are interpretive, a description of them will also be, and without any additional step, an interpretation, not after the fact, but of the fact (of experiencing).[30]

The process of reading interactive fiction meshes with Fish's analysis of the process of reading conventional literature. But in interactive fiction, these acts (making

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and revising assumptions, rendering and regretting judgments, coming to and abandoning conclusions, etc.) are part of a specific framework of thought. Interactive fiction can almost be considered a type of training in decision-making based on a critical, self- questioning, reflective attitude toward problems. Combined with the feedback mechanism, which works as a means of testing one's hypotheses, the process of reading interactive fiction is like practicing the scientific method as a way of arriving at truth and as an approach to understanding life.

In the section on the structural analysis of Adventure, I wrote of the scientific method's role as a principle or ethics of events. The scientific method is an integral aspect of the process of reading interactive fiction and accounts for a great part of its value. Each time the reader encounters another puzzle, creature, or object, it is like an experiment which provides an opportunity to confirm, reject, or revise the reader's interpretations. While playing Adventure, for example, readers test their interpretation of the story and events many times over. If they can't solve a puzzle, they must face the fact that they don't have enough information, that they overlooked or misjudged the information they do have, or that their general view of the story, i.e. the supra-story they created, might be wrong. Again and again, they must consciously review precisely what they think, why they think it, and search for alternative ways to interpret the situation. Even as readers are

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totally involved in the imaginary world and making choices about it, they must maintain a critical attitude toward themselves and the fictional situations they confront. This is the fundamental attitude underlying the scientific method.

Carl Sagan writes about science:

> It is only a tool. But it is by far the best tool we have, self-correcting, ongoing, applicable to everything. It has two rules. First: there are no sacred truths; all assumptions must be critically examined; arguments from authority are worthless. Second: whatever is inconsistent with the facts must be discarded or revised. We must understand the Cosmos as it is and not confuse how it is with how we wish it to be. The obvious is sometimes false; the unexpected is sometimes true."[31]

Holland and Niesz have concentrated on only one aspect of the scientific method implicit in the experience of reading interactive fiction, i.e. the experimental method. Because they have restricted their observations to the stage involved in testing ideas instead of viewing it as one part of the scientific method, they see this process as one of interactive fiction's limitations.

> This type of interactive fiction is clearly biased in favor of the experimental method and the optimism traditionally associated with it. By contrast, the reader of a traditional fictional text is likely to feel that her own additions or substitutions fall short. That is, a reader, whether of Charles Dickens or Henry James, is likely to feel that the fictional world she has inferred from the novel is in some final sense mysterious and unknowable, beyond her grasp, beyond that of even the most willing author. By contrast, the reader of a finite interactive text is likely to feel that she can know

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> and master this fictional universe. She is likely, in other words, to experience the optimism of the scientist at least as much as the mystery of art. The genre imitates action, rather than reflection, since if one makes a mistake and one's persona is killed, it is a simple matter to start over again. In a sense, the form intrinsic to the genre devalues the role of the individual persona and the need for reflection. As a corollary, once this kind of finite interactive fiction has been mastered, it generally ceases to hold the reader's interest...[32]

This argument would be fine if it were applied strictly to the solution of the puzzles themselves. First, some readers do experience the sense of mystery that Niesz and Holland would deny the genre, even with Adventure, a work they would probably classify as finite. This feeling that the cave is unknowable results not from any subtleties or deep meanings in the work, but from the apparent vastness of the cave and from the readers' uncertainty that they have experienced everything the story has to offer. It is significant that the authors of Adventure have encrypted the public domain version of the work, presumably to maintain this sense of mystery. It takes most people months to explore the Adventure cave, and yet Adventure is an old, relatively small program. I have watched many people playing Adventure, read many scripts, and have studied the program itself, and yet I myself am still surprised at new responses. The latest example took place when a new player found her way into the building and saw the food, water, lamp, and keys. Her immediate response was to type in "Rub lamp." I was as surprised and delighted as she when the computer accepted her input and wrote back an appropriate,

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supercilious comment about the uselessness of rubbing an electric flashlight.

Second, solving a puzzle in interactive fiction is indeed like testing one's hypothesis in the scientific method; it is a means of determining if the hypothesis is correct (actually, to be exact, it determines if the hypothesis is not incorrect). But it does not say anything about why or how one arrived at the hypothesis. It says nothing about the assumptions and personal principles upon which the hypothesis was based. It also says nothing about the readers' process of re-evaluation and revision of ideas, a process which can be frustrating, but which is an important part of open-mindedness. The scientific method is a philosophy which includes, but is not restricted to, the idea of testing, through experiments, whether one's ideas make sense.

Interactive fiction has a strong contemplative quality which Holland and Niesz have overlooked. It is not enough to think the problems through on a strictly intellectual basis. It is not possible to solve all the problems in this way, because so many of them are symbolic or emotional in nature, not intellectual. To solve such problems, readers must look inward and observe their own interpretive assumptions, review the evidence, then ask themselves why they think the way they do. When they realize that the solution they proposed will not work, they must consider alternative solutions.

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In this process of introspection and self-observation, readers turn their thoughts to situations in their past when they made the same types of decisions or had the same feelings. Even in as light-hearted a work as Adventure, the scientific method inherent in the process of reading interactive fiction causes readers to reflect on themselves. When two or more people play together, this aspect of interactive fiction often leads to philosophical discussions. For example, when the backpacker player mentioned earlier repeatedly was killed by dwarves because she didn't feel morally justified in killing them, she insisted there "must be good in every creature." Her partner replied that exactly this stance had caused her much unhappiness in life. They then discussed how best to recognize and deal with immoral people. Interactive fiction does imitate action, but it is equally a genre which elicits reflection and contemplation.

Mistacco believes that the interpretive process is the way one derives "values and a basis for moral judgment,"[33] involves one in a "critical review of the modes of intelligibility"[34] and can have the effect of a "beneficial questioning of his or her own models for judgment."[35] Holland writes of reading literature almost as if it were a therapeutic experience. For Iser, part of reading's value is its similarity to life; meaning is experienced through "the process of anticipation and retrospection, (and) the consequent unfolding of the text as a living event. ..."[36]

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> (The experience of reading is) closely akin to the way in which we gather experience in life. And thus the "reality"of the reading experience can illuminate basic patterns of real experience.[37]

Of course, in interactive fiction the reader is not confronted with reality, but his or her relationship to the imaginary world imitates the relationship to the real one. In order to solve the problems, readers must "critically examine" their assumptions and "discard or revise" any interpretation that proves to be inconsistent with the rules of the story.

The reader's choice-making, the "real-time" aspect of the step-by-step action, the necessity of making the events in the story happen, the risk-taking, and possibility of failure grips interactive fiction readers in its make-believe world. These are powerful effects for imitating "the way in which we gather experience in life."

For the past several centuries, the scientific method, which is implicitly involved in reading interactive fiction, has been a powerful tool not only in understanding natural laws, but in understanding our place in the world as well as our own nature. In a discussion about the morality of science and its search for truth, Jacob Bronowski writes: "There is indeed no system of morality which does not set a high value on truth and on knowledge, above all on a conscious knowledge of oneself."[38] I think that there can be value in reading interactive fiction merely through the reader's practicing in story-game form this contemplative,

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questioning, critical philosophical attitude towards one's self and towards the problems and choices one faces.

Recent works of interactive fiction make use of the puzzle-solving aspect inherent in the medium by imitating popular forms of literature that are also puzzle- and rule-based, especially science fiction and mystery literature. There is no reason why the interactive fiction medium should not produce works of high artistic value. I believe this will be achieved when authors learn to use its feedback mechanism for the subtle control of readers' thought processes, and especially when the contemplative, reflective qualities inherent in the medium are artistically exploited as the central literary experience.

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FOOTNOTES: READER RESPONSE

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5. Anthony Niesz and Norman Holland, "Interactive Fiction," Critical Inquiry, Vol. 11, No. 1, 1984.

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7. Crowther and Woods, Adventure,

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15. Stanley Fish, "Circumstances, Literal Language, Speech Acts, the Ordinary, the Everyday, The Obvious, What Goes without Saying and Other Special Cases," Critical Inquiry, Vol. 4, No. 4, 1978, p. 629.

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34. Mistacco, "Reading The Immoralist, p. 68.

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36. Iser, "The Implied Reader," p. 290.

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APPENDIX A: COMPLETE DESCRIPTIONS OF LOCATIONS AND OBJECTS IN COLOSSAL CAVE

1	1	You are standing at the end of a road before a small brick building.
2	1	Around you is a forest. A small stream flows out of the building and
3	1	down a gully.
4	2	You have walked up a hill, still in the forest. The road slopes back
5	2	down the other side of the hill. There is a building in the distance.
6	3	You are inside a building, a well house for a large spring.
7	4	You are in a valley in the forest beside a stream tumbling along a
8	4	rocky bed.
9	5	You are in open forest, with a deep valley to one side.
10	6	You are in open forest near both a valley and a road.
11	7	At your feet all the water of the stream splashes into a 2-inch slit
12	7	in the rock. Downstream the streambed is bare rock.
13	8	You are in a 20-foot depression floored with bare dirt. Set into the
14	8	dirt is a strong steel grate mounted in concrete. A dry streambed
15	8	leads into the depression.
16	9	You are in a small chamber beneath a 3x3 steel grate to the surface.
17	9	A low crawl over cobbles leads inward to the west.
18	10	You are crawling over cobbles in a low passage. There is a dim light
19	10	at the east end of the passage.
20	11	You are in a debris room filled with stuff washed in from the surface.
21	11	A low wide passage with cobbles becomes plugged with mud and debris
22	11	here, but an awkward canyon leads upward and west. A note on the wall
23	11	says "magic word xyzzy".
24	12	You are in an awkward sloping east/west canyon.
25	13	You are in a splendid chamber thirty feet high. The walls are frozen
26	13	rivers of orange stone. An awkward canyon and a good passage exit
27	13	From east and west sides of the chamber.
28	14	At your feet is a small pit breathing traces of white mist. An east

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29   14   passage ends here except for a small crack leading
          on.
30   15   You are at one end of a vast hall stretching for-
          ward out of sight to
31   15   the west.  There are openings to either side.
          Nearby, a wide stone
32   15   staircase leads downward.  The hall is filled with
          wisps of white mist
33   15   swaying to and fro almost as if alive.  A cold
          wind blows up the
34   15   staircase.  There is a passage at the top of a
          dome behind you.
35   16   The crack is far too small for you to follow.
36   17   You are on the east bank of a fissure slicing
          clear across the hall.
37   17   The mist is quite thick here, and the fissure is
          too wide to jump.
38   18   This is a low room with a crude note on the wall.
          The note says,
39   18   "You won't get it up the steps".
40   19   You are in the hall of the mountain king, with
          passages off in all
41   19   directions.
42   20   You are at the bottom of the pit with a broken
          neck.
43   21   You didn't make it.
44   22   The dome is unclimbable.
45   23   You are at the west end of the twopit room.  There
          is a large hole in
46   23   the wall above the pit at this end of the room.
47   24   You are at the bottom of the eastern pit in the
          twopit room.  There is
48   24   a small pool of oil in one corner of the pit.
49   25   You are at the bottom of the western pit in the
          twopit room.  There is
50   25   a large hole in the wall about 25 feet above you.
51   26   You clamber up the plant and scurry through the
          hole at the top.
52   27   You are on the west side of the fissure in the
          hall of mists.
53   28   You are in a low n/s passage at a hole in the
          floor.  The hole goes
54   28   down to an e/w passage.
55   29   You are in the south side chamber.
56   30   You are in the west side chamber of the hall of
          the mountain king.
57   30   A passage continues west and up here.
58   31   >$<
59   32   You can't get by the snake.
60   33   You are in a large room, with a passage to the
          south, a passage to the
61   33   west, and a wall of broken rock to the east.
          There is a large "y2" on
```

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62 33 A rock in the room's center.
63 34 You are in a jumble of rock, with cracks everywhere.
64 35 You're at a low window overlooking a huge pit, which extends up out of
65 35 sight. A floor is indistinctly visible over 50 feet below. Traces of
66 35 White mist cover the floor of the pit, becoming thicker to the right.
67 35 Marks in the dust around the window would seem to indicate that
68 35 someone has been here recently. Directly across the pit from you and
69 35 25 Feet away there is a similar window looking into a lighted room. A
70 35 shadowy figure can be seen there peering back at you.
71 36 You are in a dirty broken passage. To the east is a crawl. To the
72 36 west is a large passage. Above you is a hole to another passage.
73 37 You are on the brink of a small clean climbable pit. A crawl leads
74 37 west.
75 38 You are in the bottom of a small pit with a little stream, which
76 38 Enters and exits through tiny slits.
77 39 You are in a large room full of dusty rocks. There is a big hole in
78 39 the floor. There are cracks everywhere, and a passage leading east.
79 40 You have crawled through a very low wide passage parallel to and north
80 40 of the hall of mists.
81 41 You are at the west end of hall of mists. A low wide crawl continues
82 41 west and another goes north. To the south is a little passage 6 feet
83 41 Off the floor.
84 42 You are in a maze of twisty little passages, all alike.
85 43 You are in a maze of twisty little passages, all alike.
86 44 You are in a maze of twisty little passages, all alike.
87 45 You are in a maze of twisty little passages, all alike.
88 46 Dead end
89 47 Dead end
90 48 Dead end
91 49 You are in a maze of twisty little passages, all alike.
92 50 You are in a maze of twisty little passages, all

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alike.
93 51 You are in a maze of twisty little passages, all alike.
94 52 You are in a maze of twisty little passages, all alike.
95 53 You are in a maze of twisty little passages, all alike.
96 54 Dead end
97 55 You are in a maze of twisty little passages, all alike.
98 56 Dead end
99 57 You are on the brink of a thirty foot pit with a massive orange column
100 57 down one wall. You could climb down here but you could not get back
101 57 up. The maze continues at this level.
102 58 Dead end
103 59 You have crawled through a very low wide passage parallel to and north
104 59 of the hall of mists.
105 60 You are at the east end of a very long hall apparently without side
106 60 chambers. To the east a low wide crawl slants up. To the north a
107 60 round two foot hole slants down.
108 61 You are at the west end of a very long featureless hall. The hall
109 61 joins up with a narrow north/south passage.
110 62 You are at a crossover of a high n/s passage and a low e/w one.
111 63 Dead end
112 64 You are at a complex junction. A low hands and knees passage from the
113 64 north joins a higher crawl from the east to make a walking passage
114 64 going west. There is also a large room above. The air is damp here.
115 65 You are in bedquilt, a long east/west passage with holes everywhere.
116 65 To explore at random select north, south, up, or down.
117 66 You are in a room whose walls resemble swiss cheese. Obvious passages
118 66 go west, east, ne, and nw. Part of the room is occupied by a large
119 66 bedrock block.
120 67 You are at the east end of the twopit room. The floor here is
121 67 littered with thin rock slabs, which make it easy to descend the pits.
122 67 There is a path here bypassing the pits to connect passages from east
123 67 and west. There are holes all over, but the only

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big one is on the
124 67 wall directly over the west pit where you can't get to it.
125 68 You are in a large low circular chamber whose floor is an immense slab
126 68 fallen from the ceiling (slab room). East and west there once were
127 68 large passages, but they are now filled with boulders. Low small
128 68 passages go north and south, and the south one quickly bends west
129 68 around the boulders.
130 69 You are in a secret n/s canyon above a large room.
131 70 You are in a secret n/s canyon above a sizable passage.
132 71 You are in a secret canyon at a junction of three canyons, bearing
133 71 north, south, and se. The north one is as tall as the other two
134 71 combined.
135 72 You are in a large low room. Crawls lead north, se, and sw.
136 73 Dead end crawl.
137 74 You are in a secret canyon which here runs e/w. It crosses over a
138 74 very tight canyon 15 feet below. If you go down you may not be able
139 74 to get back up.
140 75 You are at a wide place in a very tight n/s canyon.
141 76 The canyon here becomes too tight to go further south.
142 77 You are in a tall e/w canyon. A low tight crawl goes 3 feet north and
143 77 seems to open up.
144 78 The canyon runs into a mass of boulders -- dead end.
145 79 The stream flows out through a pair of 1 foot diameter sewer pipes.
146 79 It would be advisable to use the exit.
147 80 You are in a maze of twisty little passages, all alike.
148 81 Dead end
149 82 Dead end
150 83 You are in a maze of twisty little passages, all alike.
151 84 You are in a maze of twisty little passages, all alike.
152 85 Dead end
153 86 Dead end
154 87 You are in a maze of twisty little passages, all alike.
155 88 You are in a long, narrow corridor stretching out

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of sight to the
156 88 west. At the eastern end is a hole through which you can see a
157 88 profusion of leaves.
158 89 There is nothing here to climb. Use "up" or "out" to leave the pit.
159 90 You have climbed up the plant and out of the pit.
160 91 You are at the top of a steep incline above a large room. You could
161 91 climb down here, but you would not be able to climb up. There is a
162 91 passage leading back to the north.
163 92 You are in the giant room. The ceiling here is too high up for your
164 92 lamp to show it. Cavernous passages lead east, north, and south. On
165 92 the west wall is scrawled the inscription, "fee fie foe foo" [sic].
166 93 The passage here is blocked by a recent cave-in.
167 94 You are at one end of an immense north/south passage.
168 95 You are in a magnificent cavern with a rushing stream, which cascades
169 95 over a sparkling waterfall into a roaring whirlpool which disappears
170 95 through a hole in the floor. Passages exit to the south and west.
171 96 You are in the soft room. The walls are covered with heavy curtains,
172 96 the floor with a thick pile carpet. Moss covers the ceiling.
173 97 This is the oriental room. Ancient oriental cave drawings cover the
174 97 walls. A gently sloping passage leads upward to the north, another
175 97 passage leads se, and a hands and knees crawl leads west.
176 98 You are following a wide path around the outer edge of a large cavern.
177 98 Far below, through a heavy white mist, strange splashing noises can be
178 98 heard. The mist rises up through a fissure in the ceiling. The path
179 98 exits to the south and west.
180 99 You are in an alcove. A small nw path seems to widen after a short
181 99 distance. An extremely tight tunnel leads east. It looks like a very
182 99 tight squeeze. An eerie light can be seen at the other end.
183 100 You're in a small chamber lit by an eerie green light. An extremely
184 100 narrow tunnel exits to the west. A dark corridor

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leads ne.
185 101 You're in the dark-room. A corridor leading south is the only exit.
186 102 You are in an arched hall. A coral passage once continued up and east
187 102 from here, but is now blocked by debris. The air smells of sea water.
188 103 You're in a large room carved out of sedimentary rock. The floor and
189 103 walls are littered with bits of shells imbedded in the stone. A
190 103 shallow passage proceeds downward, and a somewhat steeper one leads
191 103 up. A low hands and knees passage enters from the south.
192 104 You are in a long sloping corridor with ragged sharp walls.
193 105 You are in a cul-de-sac about eight feet across.
194 106 You are in an anteroom leading to a large passage to the east. Small
195 106 passages go west and up. The remnants of recent digging are evident.
196 106 A sign in midair here says "Cave under construction beyond this point.
197 106 Proceed at own risk. [Witt construction company]"
198 107 You are in a maze of twisty little passages, all different.
199 108 You are at Witt's end. Passages lead off in *all* directions.
200 109 You are in a north/south canyon about 25 feet across. The floor is
201 109 covered by white mist seeping in from the north. The walls extend
202 109 upward for well over 100 feet. Suspended from some unseen point far
203 109 above you, an enormous two-sided mirror is hanging parallel to and
204 109 Midway between the canyon walls. (The mirror is obviously provided
205 109 for the use of the dwarves, who as you know, are extremely vain.) A
206 109 Small window can be seen in either wall, some fifty feet up.
207 110 You're at a low window overlooking a huge pit, which extends up out of
208 110 sight. A floor is indistinctly visible over 50 feet below. Traces of
209 110 white mist cover the floor of the pit, becoming thicker to the left.
210 110 Marks in the dust around the window would seem to indicate that
211 110 someone has been here recently. Directly across the pit from you and

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```
212  110  25 Feet away there is a similar window looking
          into a lighted room.  A
213  110  shadowy figure can be seen there peering back at
          you.
214  111  A large stalactite extends from the roof and
          almost reaches the floor
215  111  below.  You could climb down it, and jump from it
          to the floor, but
216  111  having done so you would be unable to reach it to
          climb back up.
217  112  You are in a little maze of twisting passages, all
          different.
218  113  You are at the edge of a large underground reser-
          voir.  An opaque cloud
219  113  of white mist fills the room and rises rapidly
          upward.  The lake is
220  113  fed by a stream, which tumbles out of a hole in
          the wall about 10 feet
221  113  overhead and splashes noisily into the water some-
          where within the
222  113  Mist.  The only passage goes back toward the
          south.
223  114  Dead end
224  115  You are at the northeast end of an immense room,
          even larger than the
225  115  giant room.  It appears to be a repository for the
          "adventure"
226  115  program.  Massive torches far overhead bathe the
          room with smoky
227  115  yellow light.  Scattered about you can be seen a
          pile of bottles (all
228  115  of them empty), a nursery of young beanstalks mur-
          muring quietly, a bed
229  115  of oysters, a bundle of black rods with rusty
          stars on their ends, and
230  115  a collection of brass lanterns.  Off to one side a
          great many dwarves
231  115  are sleeping on the floor, snoring loudly.  A sign
          nearby reads: "Do
232  115  not disturb the dwarves!"  An immense mirror is
          hanging against one
233  115  wall, and stretches to the other end of the room,
          where various other
234  115  sundry objects can be glimpsed dimly in the dis-
          tance.
235  116  You are at the southwest end of the repository.
          To one side is a pit
236  116  full of fierce green snakes.  On the other side is
          a row of small
237  116  wicker cages, each of which contains a little
          sulking bird.  In one
238  116  corner is a bundle of black rods with rusty marks
          on their ends.  A
```

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239  116  large number of velvet pillows are scattered about
          on the floor.  A
240  116  vast mirror stretches off to the northeast.  At
          your feet is a large
241  116  steel grate, next to which is a sign which reads,
          "Treasure vault.
242  116  Keys in main office."
243  117  You are on one side of a large, deep chasm.  A
          heavy white mist rising
244  117  up from below obscures all view of the far side.
          A sw path leads away
245  117  from the chasm into a winding corridor.
246  118  You are in a long winding corridor sloping out of
          sight in both
247  118  directions.
248  119  You are in a secret canyon which exits to the
          north and east.
249  120  You are in a secret canyon which exits to the
          north and east.
250  121  You are in a secret canyon which exits to the
          north and east.
251  122  You are on the far side of the chasm.  A ne path
          leads away from the
252  122  chasm on this side.
253  123  You're in a long east/west corridor.  A faint rum-
          bling noise can be
254  123  heard in the distance.
255  124  The path forks here.  The left fork leads
          northeast.  A dull rumbling
256  124  seems to get louder in that direction.  The right
          fork leads southeast
257  124  down a gentle slope.  The main corridor enters
          from the west.
258  125  The walls are quite warm here.  From the north can
          be heard a steady
259  125  roar, so loud that the entire cave seems to be
          trembling.  Another
260  125  passage leads south, and a low crawl goes east.
261  126  You are on the edge of a breath-taking view.  Far
          below you is an
262  126  active volcano, from which great gouts of molten
          lava come surging
263  126  out, cascading back down into the depths.  The
          glowing rock fills the
264  126  farthest reaches of the cavern with a blood-red
          glare, giving every-
265  126  thing an eerie, macabre appearance.  The air is
          filled with flickering
266  126  sparks of ash and a heavy smell of brimstone.  The
          walls are hot to
267  126  the touch, and the thundering of the volcano
          drowns out all other
268  126  sounds.  Embedded in the jagged roof far overhead
```

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are myriad twisted
269 126 formations composed of pure white alabaster, which scatter the murky
270 126 light into sinister apparitions upon the walls. To one side is a deep
271 126 gorge, filled with a bizarre chaos of tortured rock which seems to
272 126 have been crafted by the devil himself. An immense river of fire
273 126 crashes out from the depths of the volcano, burns its way through the
274 126 gorge, and plummets into a bottomless pit far off to your left. To
275 126 the right, an immense geyser of blistering steam erupts continuously
276 126 from a barren island in the center of a sulfurous lake, which bubbles
277 126 ominously. The far right wall is aflame with an incandescence of its
278 126 own, which lends an additional infernal splendor to the already
279 126 hellish scene. A dark, foreboding passage exits to the south.
280 127 You are in a small chamber filled with large boulders. The walls are
281 127 very warm, causing the air in the room to be almost stifling from the
282 127 heat. The only exit is a crawl heading west, through which is coming
283 127 a low rumbling.
284 128 You are walking along a gently sloping north/south passage lined with
285 128 oddly shaped limestone formations.
286 129 You are standing at the entrance to a large, barren room. A sign
287 129 posted above the entrance reads: "Caution! Bear in room!"
288 130 You are inside a barren room. The center of the room is completely
289 130 empty except for some dust. Marks in the dust lead away toward the
290 130 far end of the room. The only exit is the way you came in.
291 131 You are in a maze of twisting little passages, all different.
292 132 You are in a little maze of twisty passages, all different.
293 133 You are in a twisting maze of little passages, all different.
294 134 You are in a twisting little maze of passages, all different.
295 135 You are in a twisty little maze of passages, all different.

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```
296  136  You are in a twisty maze of little passages, all
          different.
297  137  You are in a little twisty maze of passages, all
          different.
298  138  You are in a maze of little twisting passages, all
          different.
299  139  You are in a maze of little twisty passages, all
          different.
300  140  Dead end
301  -1   End
302  2
```

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APPENDIX B: ABBREVIATED DESCRIPTIONS OF LOCATIONS AND OBJECTS IN COLOSSAL CAVE

	303	1 You're at end of road again.
304	2	You're at hill in road.
305	3	You're inside building.
306	4	You're in valley.
307	5	You're in forest.
308	6	You're in forest.
309	7	You're at slit in streambed.
310	8	You're outside grate.
311	9	You're below the grate.
312	10	You're in cobble crawl.
313	11	You're in debris room.
314	13	You're in bird chamber.
315	14	You're at top of small pit.
316	15	You're in hall of mists.
317	17	You're on east bank of fissure.
318	18	You're in nugget of gold room.
319	19	You're in hall of mt king.
320	23	You're at west end of twopit room.
321	24	You're in east pit.
322	25	You're in west pit.
323	33	You're at "y2".
324	35	You're at window on pit.
325	36	You're in dirty passage.
326	39	You're in dusty rock room.
327	41	You're at west end of hall of mists.
328	57	You're at brink of pit.
329	60	You're at east end of long hall.
330	61	You're at west end of long hall.
331	64	You're at complex junction.
332	66	You're in swiss cheese room.
333	67	You're at east end of twopit room.
334	68	You're in slab room.
335	71	You're at junction of three secret canyons.
336	74	You're in secret e/w canyon above tight canyon.
337	88	You're in narrow corridor.
338	91	You're at steep incline above large room.
339	92	You're in giant room.
340	95	You're in cavern with waterfall.
341	96	You're in soft room.
342	97	You're in oriental room.
343	98	You're in misty cavern.
344	99	You're in alcove.
345	100	You're in plover room.
346	101	You're in dark-room.
347	102	You're in arched hall.
348	103	You're in shell room.
349	106	You're in anteroom.
350	108	You're at witt's end.

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351   109  You're in mirror canyon.
352   110  You're at window on pit.
353   111  You're at top of stalactite.
354   113  You're at reservoir.
355   115  You're at ne end.
356   116  You're at sw end.
357   117  You're on sw side of chasm.
358   118  You're in sloping corridor.
359   122  You're on ne side of chasm.
360   123  You're in corridor.
361   124  You're at fork in path.
362   125  You're at junction with warm walls.
363   126  You're at breath-taking view.
364   127  You're in chamber of boulders.
365   128  You're in limestone passage.
366   129  You're in front of barren room.
367   130  You're in barren room.
368   -1
```

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APPENDIX C: NUMERICALLY CODED MAP OF COLOSSAL CAVE

369	3							
370	1	2	2	44	29			
371	1	3	3	12	19	43		
372	1	4	5	13	14	46	30	
373	1	5	6	45	43			
374	1	8	63					
375	2	1	2	12	7	43	45	30
376	2	5	6	45	46			
377	3	1	3	11	32	44		
378	3	11	62					
379	3	33	65					
380	3	79	5	14				
381	4	1	4	12	45			
382	4	5	6	43	44	29		
383	4	7	5	46	30			
384	4	8	63					
385	5	4	9	43	30			
386	5	50005	6	7	45			
387	5	6	6					
388	5	5	44	46				
389	6	1	2	45				
390	6	4	9	43	44	30		
391	6	5	6	46				
392	7	1	12					
393	7	4	4	45				
394	7	5	6	43	44			
395	7	8	5	15	16	46		
396	7	595	60	14	30			
397	8	5	6	43	44	46		
398	8	1	12					
399	8	7	4	13	45			
400	8	303009	3	19	30			
401	8	593	3					
402	9	303008	11	29				
403	9	593	11					
404	9	10	17	18	19	44		
405	9	14	31					
406	9	11	51					
407	10	9	11	20	21	43		
408	10	11	19	22	44	51		
409	10	14	31					
410	11	303008	63					
411	11	9	64					
412	11	10	17	18	23	24	43	
413	11	12	25	19	29	44		
414	11	3	62					
415	11	14	31					
416	12	303008	63					
417	12	9	64					

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418	12	11	30	43	51			
419	12	13	19	29	44			
420	12	14	31					
421	13	303008	63					
422	13	9	64					
423	13	11	51					
424	13	12	25	43				
425	13	14	23	31	44			
426	14	303008	63					
427	14	9	64					
428	14	11	51					
429	14	13	23	43				
430	14	150020	30	31	34			
431	14	15	30					
432	14	16	33	44				
433	15	18	36	46				
434	15	17	7	38	44			
435	15	19	10	30	45			
436	15	150022	29	31	34	35	23	43
437	15	14	29					
438	15	34	55					
439	16	14	1					
440	17	15	38	43				
441	17	312596	39					
442	17	412021	7					
443	17	412597	41	42	44	69		
444	17	27	41					
445	18	15	38	11	45			
446	19	15	10	29	43			
447	19	311028	45	36				
448	19	311029	46	37				
449	19	311030	44	7				
450	19	32	45					
451	19	35074	49					
452	19	211032	49					
453	19	74	66					
454	20	0	1					
455	21	0	1					
456	22	15	1					
457	23	67	43	42				
458	23	68	44	61				
459	23	25	30	31				
460	23	648	52					
461	24	67	29	11				
462	25	23	29	11				
463	25	724031	56					
464	25	26	56					
465	26	88	1					
466	27	312596	39					
467	27	412021	7					
468	27	412597	41	42	43	69		
469	27	17	41					
470	27	40	45					

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471	27	41	44				
472	28	19	38	11	46		
473	28	33	45	55			
474	28	36	30	52			
475	29	19	38	11	45		
476	30	19	38	11	43		
477	30	62	44	29			
478	31	524089	1				
479	31	90	1				
480	32	19	1				
481	33	3	65				
482	33	28	46				
483	33	34	43	53	54		
484	33	35	44				
485	33	159302	71				
486	33	100	71				
487	34	33	30	55			
488	34	15	29				
489	35	33	43	55			
490	35	20	39				
491	36	37	43	17			
492	36	28	29	52			
493	36	39	44				
494	36	65	70				
495	37	36	44	17			
496	37	38	30	31	56		
497	38	37	56	29	11		
498	38	595	60	14	30	4	5
499	39	36	43	23			
500	39	64	30	52	58		
501	39	65	70				
502	40	41	1				
503	41	42	46	29	23	56	
504	41	27	43				
505	41	59	45				
506	41	60	44	17			
507	42	41	29				
508	42	42	45				
509	42	43	43				
510	42	45	46				
511	42	80	44				
512	43	42	44				
513	43	44	46				
514	43	45	43				
515	44	43	43				
516	44	48	30				
517	44	50	46				
518	44	82	45				
519	45	42	44				
520	45	43	45				
521	45	46	43				
522	45	47	46				
523	45	87	29	30			

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524	46	45	44	11	
525	47	45	43	11	
526	48	44	29	11	
527	49	50	43		
528	49	51	44		
529	50	44	43		
530	50	49	44		
531	50	51	30		
532	50	52	46		
533	51	49	44		
534	51	50	29		
535	51	52	43		
536	51	53	46		
537	52	50	44		
538	52	51	43		
539	52	52	46		
540	52	53	29		
541	52	55	45		
542	52	86	30		
543	53	51	44		
544	53	52	45		
545	53	54	46		
546	54	53	44	11	
547	55	52	44		
548	55	55	45		
549	55	56	30		
550	55	57	43		
551	56	55	29	11	
552	57	13	30	56	
553	57	55	44		
554	57	58	46		
555	57	83	45		
556	57	84	43		
557	58	57	43	11	
558	59	27	1		
559	60	41	43	29	17
560	60	61	44		
561	60	62	45	30	52
562	61	60	43		
563	61	62	45		
564	61	100107	46		
565	62	60	44		
566	62	63	45		
567	62	30	43		
568	62	61	46		
569	63	62	46	11	
570	64	39	29	56	59
571	64	65	44	70	
572	64	103	45	74	
573	64	106	43		
574	65	64	43		
575	65	66	44		
576	65	80556	46		

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577	65	68	61		
578	65	80556	29		
579	65	50070	29		
580	65	39	29		
581	65	60556	45		
582	65	75072	45		
583	65	71	45		
584	65	80556	30		
585	65	106	30		
586	66	65	47		
587	66	67	44		
588	66	80556	46		
589	66	77	25		
590	66	96	43		
591	66	50556	50		
592	66	97	72		
593	67	66	43		
594	67	23	44	42	
595	67	24	30	31	
596	68	23	46		
597	68	69	29	56	
598	68	65	45		
599	69	68	30	61	
600	69	331120	46		
601	69	119	46		
602	69	109	45		
603	69	113	75		
604	70	71	45		
605	70	65	30	23	
606	70	111	46		
607	71	65	48		
608	71	70	46		
609	71	110	45		
610	72	65	70		
611	72	118	49		
612	72	73	45		
613	72	97	48	72	
614	73	72	46	17	11
615	74	19	43		
616	74	331120	44		
617	74	121	44		
618	74	75	30		
619	75	76	46		
620	75	77	45		
621	76	75	45		
622	77	75	43		
623	77	78	44		
624	77	66	45	17	
625	78	77	46		
626	79	3	1		
627	80	42	45		
628	80	80	44		
629	80	80	46		

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630	80	81	43		
631	81	80	44	11	
632	82	44	46	11	
633	83	57	46		
634	83	84	43		
635	83	85	44		
636	84	57	45		
637	84	83	44		
638	84	114	50		
639	85	83	43	11	
640	86	52	29	11	
641	87	45	29	30	
642	88	25	30	56	43
643	88	20	39		
644	88	92	44	27	
645	89	25	1		
646	90	23	1		
647	91	95	45	73	23
648	91	72	30	56	
649	92	88	46		
650	92	93	43		
651	92	94	45		
652	93	92	46	27	11
653	94	92	46	27	23
654	94	309095	45	3	73
655	94	611	45		
656	95	94	46	11	
657	95	92	27		
658	95	91	44		
659	96	66	44	11	
660	97	66	48		
661	97	72	44	17	
662	97	98	29	45	73
663	98	97	46	72	
664	98	99	44		
665	99	98	50	73	
666	99	301	43	23	
667	99	100	43		
668	100	301	44	23	11
669	100	99	44		
670	100	159302	71		
671	100	33	71		
672	100	101	47	22	
673	101	100	46	71	11
674	102	103	30	74	11
675	103	102	29	38	
676	103	104	30		
677	103	114618	46		
678	103	115619	46		
679	103	64	46		
680	104	103	29	74	
681	104	105	30		
682	105	104	29	11	

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683	105	103	74					
684	106	64	29					
685	106	65	44					
686	106	108	43					
687	107	131	46					
688	107	132	49					
689	107	133	47					
690	107	134	48					
691	107	135	29					
692	107	136	50					
693	107	137	43					
694	107	138	44					
695	107	139	45					
696	107	61	30					
697	108	95556	43	45	46	47	48	49
698	108	106	43					
699	108	626	44					
700	109	69	46					
701	109	113	45	75				
702	110	71	44					
703	110	20	39					
704	111	70	45					
705	111	40050	30	39	56			
706	111	50053	30					
707	111	45	30					
708	112	131	49					
709	112	132	45					
710	112	133	43					
711	112	134	50					
712	112	135	48					
713	112	136	47					
714	112	137	44					
715	112	138	30					
716	112	139	29					
717	112	140	46					
718	113	109	46	11	109			
719	114	84	48					
720	115	116	49					
721	116	115	47					
722	116	593	30					
723	117	118	49					
724	117	233660	41	42	69	47		
725	117	332661	41					
726	117	303	41					
727	117	332021	39					
728	117	596	39					
729	118	72	30					
730	118	117	29					
731	119	69	45	11				
732	119	653	43	7				
733	120	69	45					
734	120	74	43					
735	121	74	43	11				

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736	121	653	45	7		
737	122	123	47			
738	122	233660	41	42	69	49
739	122	303	41			
740	122	596	39			
741	122	124	77			
742	122	126	28			
743	122	129	40			
744	123	122	44			
745	123	124	43	77		
746	123	126	28			
747	123	129	40			
748	124	123	44			
749	124	125	47	36		
750	124	128	48	37	30	
751	124	126	28			
752	124	129	40			
753	125	124	46	77		
754	125	126	45	28		
755	125	127	43	17		
756	126	125	46	23	11	
757	126	124	77			
758	126	610	30	39		
759	127	125	44	11	17	
760	127	124	77			
761	127	126	28			
762	128	124	45	29	77	
763	128	129	46	30	40	
764	128	126	28			
765	129	128	44	29		
766	129	124	77			
767	129	130	43	19	40	3
768	129	126	28			
769	130	129	44	11		
770	130	124	77			
771	130	126	28			
772	131	107	44			
773	131	132	48			
774	131	133	50			
775	131	134	49			
776	131	135	47			
777	131	136	29			
778	131	137	30			
779	131	138	45			
780	131	139	46			
781	131	112	43			
782	132	107	50			
783	132	131	29			
784	132	133	45			
785	132	134	46			
786	132	135	44			
787	132	136	49			
788	132	137	47			

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789	132	138	43
790	132	139	30
791	132	112	48
792	133	107	29
793	133	131	30
794	133	132	44
795	133	134	47
796	133	135	49
797	133	136	43
798	133	137	45
799	133	138	50
800	133	139	48
801	133	112	46
802	134	107	47
803	134	131	45
804	134	132	50
805	134	133	48
806	134	135	43
807	134	136	30
808	134	137	46
809	134	138	29
810	134	139	44
811	134	112	49
812	135	107	45
813	135	131	48
814	135	132	30
815	135	133	46
816	135	134	43
817	135	136	44
818	135	137	49
819	135	138	47
820	135	139	50
821	135	112	29
822	136	107	43
823	136	131	44
824	136	132	29
825	136	133	49
826	136	134	30
827	136	135	46
828	136	137	50
829	136	138	48
830	136	139	47
831	136	112	45
832	137	107	48
833	137	131	47
834	137	132	46
835	137	133	30
836	137	134	29
837	137	135	50
838	137	136	45
839	137	138	49
840	137	139	43
841	137	112	44

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864	4	
865	2	road
866	2	hill
867	3	enter
868	4	upstr
869	5	downs
870	6	fores
871	7	forwa
872	7	conti
873	7	onwar
874	8	back
875	8	retur
876	8	retre
877	9	valle
878	10	stair
879	11	out
880	11	outsi
881	11	exit
882	11	leave
883	12	build
884	12	house
885	13	gully
886	14	strea
887	15	rock
888	16	bed
889	17	crawl
890	18	cobbl
891	19	inwar
892	19	insid
893	19	in
894	20	surfa
895	21	null
896	21	nowhe
897	22	dark
898	23	passa
899	23	tunne
900	24	low
901	25	canyo
902	26	awkwa
903	27	giant
904	28	view
905	29	upwar
906	29	up
907	29	u
908	29	above
909	29	ascen
910	30	d
911	30	downw
912	30	down

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913	30	desce
914	31	pit
915	32	outdo
916	33	crack
917	34	steps
918	35	dome
919	36	left
920	37	right
921	38	hall
922	39	jump
923	40	barre
924	41	over
925	42	acros
926	43	east
927	43	e
928	44	west
929	44	w
930	45	north
931	45	n
932	46	south
933	46	s
934	47	ne
935	48	se
936	49	sw
937	50	nw
938	51	debri
939	52	hole
940	53	wall
941	54	broke
942	55	y2
943	56	climb
944	57	look
945	57	exami
946	57	touch
947	57	descr
948	58	floor
949	59	room
950	60	slit
951	61	slab
952	61	slabr
953	62	xyzzy
954	63	depre
955	64	entra
956	65	plugh
957	66	secre
958	67	cave
959	69	cross
960	70	bedqu
961	71	plove
962	72	orien
963	73	caver
964	74	shell
965	75	reser

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```
966  76   main
967  76   offic
968  77   fork
969  1001 keys
970  1001 key
971  1002 lamp
972  1002 headl
973  1002 lante
974  1003 grate
975  1004 cage
976  1005 wand
977  1005 rod
978  1006 wand
979  1006 rod      (must be next object after "real" rod)
980  1007 steps
981  1008 bird
982  1009 door
983  1010 pillo
984  1010 velve
985  1011 snake
986  1012 fissu
987  1013 table
988  1014 clam
989  1015 oyste
990  1016 magaz
991  1016 issue
992  1016 spelu
993  1016 "spel
994  1017 dwarf
995  1017 dwarv
996  1018 knife
997  1018 knive
998  1019 food
999  1019 ratio
1000 1020 bottl
1001 1020 jar
1002 1021 water
1003 1021 h2o
1004 1022 oil
1005 1023 mirro
1006 1024 plant
1007 1024 beans
1008 1025 plant(must be next object after "real" plant)
1009 1026 stala
1010 1027 shado
1011 1027 figur
1012 1028 axe
1013 1029 drawi
1014 1030 pirat
1015 1031 drago
1016 1032 chasm
1017 1033 troll
1018 1034 troll(must be next object after "real" troll)
```

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1019 1035 bear
1020 1036 messa
1021 1037 volca
1022 1037 geyse(same as volcano)
1023 1038 machi
1024 1038 vendi
1025 1039 batte
1026 1040 carpe
1027 1040 moss
1028 1050 gold
1029 1050 nugge
1030 1051 diamo
1031 1052 silve
1032 1052 bars
1033 1053 jewel
1034 1054 coins
1035 1055 chest
1036 1055 box
1037 1055 treas
1038 1056 eggs
1039 1056 egg
1040 1056 nest
1041 1057 tride
1042 1058 vase
1043 1058 ming
1044 1058 shard
1045 1058 potte
1046 1059 emera
1047 1060 plati
1048 1060 pyram
1049 1061 pearl
1050 1062 rug
1051 1062 persi
1052 1063 spice
1053 1064 chain
1054 2001 carry
1055 2001 take
1056 2001 keep
1057 2001 catch
1058 2001 steal
1059 2001 captu
1060 2001 get
1061 2001 tote
1062 2002 drop
1063 2002 relea
1064 2002 free
1065 2002 disca
1066 2002 dump
1067 2003 say
1068 2003 chant
1069 2003 sing
1070 2003 utter
1071 2003 mumbl

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1072 2004 unloc
1073 2004 open
1074 2005 nothi
1075 2006 lock
1076 2006 close
1077 2007 light
1078 2007 on
1079 2008 extin
1080 2008 off
1081 2009 wave
1082 2009 shake
1083 2009 swing
1084 2010 calm
1085 2010 placa
1086 2010 tame
1087 2011 walk
1088 2011 run
1089 2011 trave
1090 2011 go
1091 2011 proce
1092 2011 conti
1093 2011 explo
1094 2011 goto
1095 2011 follo
1096 2011 turn
1097 2012 attac
1098 2012 kill
1099 2012 slay
1100 2012 fight
1101 2012 hit
1102 2012 strik
1103 2013 pour
1104 2014 eat
1105 2014 devou
1106 2015 drink
1107 2016 rub
1108 2017 throw
1109 2017 toss
1110 2018 quit
1111 2019 find
1112 2019 where
1113 2020 inven
1114 2021 feed
1115 2022 fill
1116 2023 blast
1117 2023 deton
1118 2023 ignit
1119 2023 blowu
1120 2024 score
1121 2025 fee
1122 2025 fie
1123 2025 foe
1124 2025 foo

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```
1125 2025 fum
1126 2026 brief
1127 2027 read
1128 2027 perus
1129 2028 break
1130 2028 shatt
1131 2028 smash
1132 2029 wake
1133 2029 distu
1134 2030 suspe
1135 2030 pause
1136 2030 save
1137 2031 hours
1138 3001 fee
1139 3002 fie
1140 3003 foe
1141 3004 foo
1142 3005 fum
1143 3050 sesam
1144 3050 opens
1145 3050 abra
1146 3050 abrac
1147 3050 shaza
1148 3050 hocus
1149 3050 pocus
1150 3051 help
1151 3051 ?
1152 3064 tree
1153 3064 trees
1154 3066 dig
1155 3066 excav
1156 3068 lost
1157 3069 mist
1158 3079 fuck
1159 3139 stop
1160 3142 info
1161 3142 infor
1162 3147 swim
1163 -1
```

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APPENDIX E:

```
1164 5
1165 1    Set of keys
1166 000  There are some keys on the ground here.
1167 2    Brass lantern
1168 000  There is a shiny brass lamp nearby.
1169 100  There is a lamp shining nearby.
1170 3    *Grate
1171 000  The grate is locked.
1172 100  The grate is open.
1173 4    Wicker cage
1174 000  There is a small wicker cage discarded nearby.
1175 5    Black rod
1176 000  A three foot black rod with a rusty star on an end
          lies nearby.
1177 6    Black rod
1178 000  A three foot black rod with a rusty mark on an end
          lies nearby.
1179 7    *Steps
1180 000  Rough stone steps lead down the pit.
1181 100  Rough stone steps lead up the dome.
1182 8    Little bird in cage
1183 000  A cheerful little bird is sitting here singing.
1184 100  There is a little bird in the cage.
1185 9    *Rusty door
1186 000  The way north is barred by a massive, rusty, iron
          door.
1187 100  The way north leads through a massive, rusty, iron
          door.
1188 10   Velvet pillow
1189 000  A small velvet pillow lies on the floor.
1190 11   *Snake
1191 000  A huge green fierce snake bars the way!
1192 100  >$<  (Chased away)
1193 12   *Fissure
1194 000  >$<
1195 100  A crystal bridge now spans the fissure.
1196 200  The crystal bridge has vanished!
1197 13   *Stone tablet
1198 000  A massive stone tablet imbedded in the wall reads:
1199 000  "Congratulations on bringing light into the dark-
          room!"
1200 14   Giant clam  >grunt!<
1201 000  There is an enormous clam here with its shell
          tightly closed.
1202 15   Giant oyster  >groan!<
1203 000  There is an enormous oyster here with its shell
          tightly closed.
1204 100  Interesting.  There seems to be something written
          on the underside of
```


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```
1205 100  The oyster.
1206 16   "Spelunker today"
1207 000  There are a few recent issues of "Spelunker today"
          magazine here.
1208 19   Tasty food
1209 000  There is food here.
1210 20   Small bottle
1211 000  There is a bottle of water here.
1212 100  There is an empty bottle here.
1213 200  There is a bottle of oil here.
1214 21   Water in the bottle
1215 22   Oil in the bottle
1216 23   *Mirror
1217 000  >$<
1218 24   *Plant
1219 000  There is a tiny little plant in the pit, murmuring
          "water, water, ..."
1220 100  The plant spurts into furious growth for a few
          seconds.
1221 200  There is a 12-foot-tall beanstalk stretching up
          out of the pit,
1222 200  Bellowing "water!! water!!"
1223 300  The plant grows explosively, almost filling the
          bottom of the pit.
1224 400  There is a gigantic beanstalk stretching all the
          way up to the hole.
1225 500  You've over-watered the plant!  It's shriveling
          up!  It's, it's...
1226 25   *Phony plant (seen in twopit room only when tall
          enough)
1227 000  >$<
1228 100  The top of a 12-foot-tall beanstalk is poking out
          of the west pit.
1229 200  There is a huge beanstalk growing out of the west
          pit up to the hole.
1230 26   *Stalactite
1231 000  >$<
1232 27   *Shadowy figure
1233 000  The shadowy figure seems to be trying to attract
          your attention.
1234 28   Dwarf's axe
1235 000  There is a little axe here.
1236 100  There is a little axe lying beside the bear.
1237 29   *Cave drawings
1238 000  >$<
1239 30   *Pirate
1240 000  >$<
1241 31   *Dragon
1242 000  A huge green fierce dragon bars the way!
1243 100  Congratulations!  You have just vanquished a dra-
          gon with your bare
1244 100  Hands!  (unbelievable, isn't it?)
1245 200  The body of a huge green dead dragon is lying off
```

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```
          to one side.
1246 32   *Chasm
1247 000  A rickety wooden bridge extends across the chasm,
          vanishing into the
1248 000  Mist.  A sign posted on the bridge reads, "stop!
          pay troll!"
1249 100  The wreckage of a bridge (and a dead bear) can be
          seen at the bottom
1250 100  Of the chasm.
1251 33   *Troll
1252 000  A burly troll stands by the bridge and insists you
          throw him a
1253 000  Treasure before you may cross.
1254 100  The troll steps out from beneath the bridge and
          blocks your way.
1255 200  >$<  (Chased away)
1256 34   *Phony troll
1257 000  The troll is nowhere to be seen.
1258 35   >$<  (Bear uses rtext 141)
1259 000  There is a ferocious cave bear eying you from the
          far end of the room!
1260 100  There is a gentle cave bear sitting placidly in
          one corner.
1261 200  There is a contented-looking bear wandering about
          nearby.
1262 300  >$<  (Dead)
1263 36   *Message in second maze
1264 000  There is a message scrawled in the dust in a
          flowery script, reading:
1265 000  "This is not the maze where the pirate leaves his
          treasure chest."
1266 37   *Volcano and/or geyser
1267 000  >$<
1268 38   *Vending machine
1269 000  There is a massive vending machine here.  The
          instructions on it read:
1270 000  "Drop coins here to receive fresh batteries."
1271 39   Batteries
1272 000  There are fresh batteries here.
1273 100  Some worn-out batteries have been discarded
          nearby.
1274 40   *Carpet and/or moss
1275 000  >$<
1276 50   Large gold nugget
1277 000  There is a large sparkling nugget of gold here!
1278 51   Several diamonds
1279 000  There are diamonds here!
1280 52   Bars of silver
1281 000  There are bars of silver here!
1282 53   Precious jewelry
1283 000  There is precious jewelry here!
1284 54   Rare coins
1285 000  There are many coins here!
```

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```
1286 55   Treasure chest
1287 000  The pirate's treasure chest is here!
1288 56   Golden eggs
1289 000  There is a large nest here, full of golden eggs!
1290 100  The nest of golden eggs has vanished!
1291 200  Done!
1292 57   Jeweled trident
1293 000  There is a jewel-encrusted trident here!
1294 58   Ming vase
1295 000  There is a delicate, precious, ming vase here!
1296 100  The vase is now resting, delicately, on a velvet
          pillow.
1297 200  The floor is littered with worthless shards of
          pottery.
1298 300  The ming vase drops with a delicate crash.
1299 59   Egg-sized emerald
1300 000  There is an emerald here the size of a plover's
          egg!
1301 60   Platinum pyramid
1302 000  There is a platinum pyramid here, 8 inches on a
          side!
1303 61   Glistening pearl
1304 000  Off to one side lies a glistening pearl!
1305 62   Persian rug
1306 000  There is a persian rug spread out on the floor!
1307 100  The dragon is sprawled out on a persian rug!!
1308 63   Rare spices
1309 000  There are rare spices here!
1310 64   Golden chain
1311 000  There is a golden chain lying in a heap on the
          floor!
1312 100  The bear is locked to the wall with a golden
          chain!
1313 200  There is a golden chain locked to the wall!
1314 -1
```

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APPENDIX F: HELPFUL MESSAGES

```
1315 6
1316 1    Somewhere nearby is colossal cave, where others
          have found fortunes in
1317 1    treasure and gold, though it is rumored that some
          who enter are never
1318 1    seen again.  Magic is said to work in the cave.  I
          will be your eyes
1319 1    and hands.  Direct me with commands of 1 or 2
          words.  I should warn
1320 1    you that I look at only the first five letters of
          each word, so you'll
1321 1    have to enter "northeast" as "ne" to distinguish
          it from "north".
1322 1    (Should you get stuck, type "help" for some gen-
          eral hints.  For infor-
1323 1    mation on how to end your adventure, etc., type
          "info".)
1324 1         - - -
1325 1    This program was originally developed by willie
          crowther.  Most of the
1326 1    features of the current program were added by don
          woods (don @ su-ai).
1327 1    contact don if you have any questions, comments,
          etc.
1328 1    Address complaints about the unix version to jim @
          rand-unix.
1329 2    A little dwarf with a big knife blocks your way.
1330 3    A little dwarf just walked around a corner, saw
          you, threw a little
1331 3    axe at you which missed, cursed, and ran away.
1332 4    There is a threatening little dwarf in the room
          with you!
1333 5    One sharp nasty knife is thrown at you!
1334 6    None of them hit you!
1335 7    One of them gets you!
1336 8    A hollow voice says "plugh".
1337 9    There is no way to go that direction.
1338 10   I am unsure how you are facing.  Use compass
          points or nearby objects.
1339 11   I don't know in from out here.  Use compass points
          or name something
1340 11   in the general direction you want to go.
1341 12   I don't know how to apply that word here.
1342 13   I don't understand that!
1343 14   I'm game.  Would you care to explain how?
1344 15   Sorry, but I am not allowed to give more detail.
          I will repeat the
1345 15   long description of your location.
1346 16   It is now pitch dark.  If you proceed you will
```


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```
          likely fall into a pit.
1347 17   If you prefer, simply type w rather than west.
1348 18   Are you trying to catch the bird?
1349 19   The bird is frightened right now and you cannot
          catch it no matter
1350 19   what you try.  Perhaps you might try later.
1351 20   Are you trying to somehow deal with the snake?
1352 21   You can't kill the snake, or drive it away, or
          avoid it, or anything
1353 21   like that.  There is a way to get by, but you
          don't have the necessary
1354 21   resources right now.
1355 22   Do you really want to quit now?
1356 23   You fell into a pit and broke every bone in your
          body!
1357 24   You are already carrying it!
1358 25   You can't be serious!
1359 26   The bird was unafraid when you entered, but as you
          approach it becomes
1360 26   disturbed and you cannot catch it.
1361 27   You can catch the bird, but you cannot carry it.
1362 28   There is nothing here with a lock!
1363 29   You aren't carrying it!
1364 30   The little bird attacks the green snake, and in an
          astounding flurry
1365 30   drives the snake away.
1366 31   You have no keys!
1367 32   It has no lock.
1368 33   I don't know how to lock or unlock such a thing.
1369 34   It was already locked.
1370 35   The grate is now locked.
1371 36   The grate is now unlocked.
1372 37   It was already unlocked.
1373 38   You have no source of light.
1374 39   Your lamp is now on.
1375 40   Your lamp is now off.
1376 41   There is no way to get past the bear to unlock the
          chain, which is
1377 41   probably just as well.
1378 42   Nothing happens.
1379 43   Where?
1380 44   There is nothing here to attack.
1381 45   The little bird is now dead.  Its body disappears.
1382 46   Attacking the snake both doesn't work and is very
          dangerous.
1383 47   You killed a little dwarf.
1384 48   You attack a little dwarf, but he dodges out of
          the way.
1385 49   With what?  Your bare hands?
1386 50   Good try, but that is an old worn-out magic word.
1387 51   I know of places, actions, and things.  Most of my
          vocabulary
1388 51   describes places and is used to move you there.
```

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To move, try words
1389 51 like forest, building, downstream, enter, east, west, north, south,
1390 51 up, or down. I know about a few special objects, like a black rod
1391 51 hidden in the cave. These objects can be manipulated using some of
1392 51 the action words that I know. Usually you will need to give both the
1393 51 object and action words (in either order), but sometimes I can infer
1394 51 the object from the verb alone. Some objects also imply verbs; in
1395 51 particular, "inventory" implies "take inventory", which causes me to
1396 51 give you a list of what you're carrying. The objects have side
1397 51 effects; for instance, the rod scares the bird. Usually people having
1398 51 trouble moving just need to try a few more words. Usually people
1399 51 trying unsuccessfully to manipulate an object are attempting something
1400 51 beyond their (or my!) capabilities and should try a completely
1401 51 different tack. To speed the game you can sometimes move long
1402 51 distances with a single word. For example, "building" usually gets
1403 51 you to the building from anywhere above ground except when lost in the
1404 51 forest. Also, note that cave passages turn a lot, and that leaving a
1405 51 room to the north does not guarantee entering the next from the south.
1406 51 Good luck!
1407 52 It misses!
1408 53 It gets you!
1409 54 OK
1410 55 You can't unlock the keys.
1411 56 You have crawled around in some little holes and wound up back in the
1412 56 main passage.
1413 57 I don't know where the cave is, but hereabouts no stream can run on
1414 57 the surface for long. I would try the stream.
1415 58 I need more detailed instructions to do that.
1416 59 I can only tell you what you see as you move about and manipulate
1417 59 things. I cannot tell you where remote things are.
1418 60 I don't know that word.
1419 61 What?

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```
1420 62   Are you trying to get into the cave?
1421 63   The grate is very solid and has a hardened steel
          lock.  You cannot
1422 63   enter without a key, and there are no keys nearby.
          I would recommend
1423 63   looking elsewhere for the keys.
1424 64   The trees of the forest are large hardwood oak and
          maple, with an
1425 64   occasional grove of pine or spruce.  There is
          quite a bit of under-
1426 64   growth, largely birch and ash saplings plus non-
          descript bushes of
1427 64   various sorts.  This time of year visibility is
          quite restricted by
1428 64   all the leaves, but travel is quite easy if you
          detour around the
1429 64   spruce and berry bushes.
1430 65   Welcome to adventure!!  Would you like instruc-
          tions?
1431 66   Digging without a shovel is quite impractical.
          Even with a shovel
1432 66   progress is unlikely.
1433 67   Blasting requires dynamite.
1434 68   I'm as confused as you are.
1435 69   Mist is a white vapor, usually water, seen from
          time to time in
1436 69   caverns.  It can be found anywhere but is fre-
          quently a sign of a deep
1437 69   pit leading down to water.
1438 70   Your feet are now wet.
1439 71   I think I just lost my appetite.
1440 72   Thank you, it was delicious!
1441 73   You have taken a drink from the stream.  The water
          tastes strongly of
1442 73   minerals, but is not unpleasant.  It is extremely
          cold.
1443 74   The bottle of water is now empty.
1444 75   Rubbing the electric lamp is not particularly
          rewarding.  Anyway,
1445 75   nothing exciting happens.
1446 76   Peculiar.  Nothing unexpected happens.
1447 77   Your bottle is empty and the ground is wet.
1448 78   You can't pour that.
1449 79   Watch it!
1450 80   Which way?
1451 81   Oh dear, you seem to have gotten yourself killed.
          I might be able to
1452 81   help you out, but i've never really done this
          before.  Do you want me
1453 81   to try to reincarnate you?
1454 82   All right.  But don't blame me if something goes
          wr......
1455 82                          --- Poof!! ---
```

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1456 82 You are engulfed in a cloud of orange smoke. Coughing and gasping,
1457 82 you emerge from the smoke and find....
1458 83 You clumsy oaf, you've done it again! I don't know how long I can
1459 83 keep this up. Do you want me to try reincarnating you again?
1460 84 Okay, now where did I put my orange smoke?.... >poof!<
1461 84 Everything disappears in a dense cloud of orange smoke.
1462 85 Now you've really done it! I'm out of orange smoke! You don't expect
1463 85 me to do a decent reincarnation without any orange smoke, do you?
1464 86 Okay, if you're so smart, do it yourself! I'm leaving!
1465 90 >>> Messages 81 thru 90 are reserved for "obituaries". <<<
1466 91 Sorry, but I no longer seem to remember how it was you got here.
1467 92 You can't carry anything more. You'll have to drop something first.
1468 93 You can't go through a locked steel grate!
1469 94 I believe what you want is right here with you.
1470 95 You don't fit through a two-inch slit!
1471 96 I respectfully suggest you go across the bridge instead of jumping.
1472 97 There is no way across the fissure.
1473 98 You're not carrying anything.
1474 99 You are currently holding the following:
1475 100 It's not hungry (it's merely pinin' for the fjords). Besides, you
1476 100 have no bird seed.
1477 101 The snake has now devoured your bird.
1478 102 There's nothing here it wants to eat (except perhaps you).
1479 103 You fool, dwarves eat only coal! Now you've made him *really* mad!!
1480 104 You have nothing in which to carry it.
1481 105 Your bottle is already full.
1482 106 There is nothing here with which to fill the bottle.
1483 107 Your bottle is now full of water.
1484 108 Your bottle is now full of oil.
1485 109 You can't fill that.
1486 110 Don't be ridiculous!
1487 111 The door is extremely rusty and refuses to open.
1488 112 The plant indignantly shakes the oil off its leaves and asks, "water?"
1489 113 The hinges are quite thoroughly rusted now and won't budge.
1490 114 The oil has freed up the hinges so that the door

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will now move,
1491 114 although it requires some effort.
1492 115 The plant has exceptionally deep roots and cannot be pulled free.
1493 116 The dwarves' knives vanish as they strike the walls of the cave.
1494 117 Something you're carrying won't fit through the tunnel with you.
1495 117 You'd best take inventory and drop something.
1496 118 You can't fit this five-foot clam through that little passage!
1497 119 You can't fit this five-foot oyster through that little passage!
1498 120 I advise you to put down the clam before opening it. >strain!<
1499 121 I advise you to put down the oyster before opening it. >wrench!<
1500 122 You don't have anything strong enough to open the clam.
1501 123 You don't have anything strong enough to open the oyster.
1502 124 A glistening pearl falls out of the clam and rolls away. Goodness,
1503 124 this must really be an oyster. (I never was very good at identifying
1504 124 bivalves.) Whatever it is, it has now snapped shut again.
1505 125 The oyster creaks open, revealing nothing but oyster inside. It
1506 125 promptly snaps shut again.
1507 126 You have crawled around in some little holes and found your way
1508 126 blocked by a recent cave-in. You are now back in the main passage.
1509 127 There are faint rustling noises from the darkness behind you.
1510 128 Out from the shadows behind you pounces a bearded pirate! "Har, har,"
1511 128 he chortles, "I'll just take all this booty and hide it away with me
1512 128 chest deep in the maze!" He snatches your treasure and vanishes into
1513 128 the gloom.
1514 129 A sepulchral voice reverberating through the cave, says, "Cave closing
1515 129 soon. All adventurers exit immediately through main office."
1516 130 A mysterious recorded voice groans into life and announces:
1517 130 "This exit is closed. Please leave via main office."
1518 131 It looks as though you're dead. Well, seeing as how it's so close to

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```
1519 131  closing time anyway, I think we'll just call it a
          day.
1520 132  The sepulchral voice entones, "The cave is now
          closed."  As the echoes
1521 132  fade, there is a blinding flash of light (and a
          small puff of orange
1522 132  Smoke). . . .    As your eyes refocus, you look
          around and find...
1523 133  there is a loud explosion, and a twenty-foot hole
          appears in the far
1524 133  wall, burying the dwarves in the rubble.  You
          march through the hole
1525 133  and find yourself in the main office, where a
          cheering band of
1526 133  friendly elves carry the conquering adventurer off
          into the sunset.
1527 134  There is a loud explosion, and a twenty-foot hole
          appears in the far
1528 134  wall, burying the snakes in the rubble.  A river
          of molten lava pours
1529 134  in through the hole, destroying everything in its
          path, including you!
1530 135  There is a loud explosion, and you are suddenly
          splashed across the
1531 135  walls of the room.
1532 136  The resulting ruckus has awakened the dwarves.
          There are now several
1533 136  threatening little dwarves in the room with you!
          Most of them throw
1534 136  knives at you!  All of them get you!
1535 137  Oh, leave the poor unhappy bird alone.
1536 138  I daresay whatever you want is around here some-
          where.
1537 139  I don't know the word "stop".  Use "quit" if you
          want to give up.
1538 140  You can't get there from here.
1539 141  You are being followed by a very large, tame bear.
1540 142  If you want to end your adventure early, say
          "quit".  To suspend your
1541 142  adventure such that you can continue later, say
          "suspend" (or "pause"
1542 142  Or "save").  To see what hours the cave is nor-
          mally open, say "hours".
1543 142  To see how well you're doing, say "score".  To get
          full credit for a
1544 142  treasure, you must have left it safely in the
          building, though you get
1545 142  partial credit just for locating it.  You lose
          points for getting
1546 142  killed, or for quitting, though the former costs
          you more.  There are
1547 142  also points based on how much (if any) of the cave
          you've managed to
```

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```
1548 142  explore; in particular, there is a large bonus
          just for getting in (to
1549 142  distinguish the beginners from the rest of the
          pack), and there are
1550 142  other ways to determine whether you've been
          through some of the more
1551 142  harrowing sections.  If you think you've found all
          the treasures, just
1552 142  keep exploring for a while.  If nothing interest-
          ing happens, you
1553 142  haven't found them all yet.  If something
          interesting *does* happen,
1554 142  it means you're getting a bonus and have an oppor-
          tunity to garner many
1555 142  more points in the master's section.  I may occa-
          sionally offer hints
1556 142  if you seem to be having trouble.  If I do, I'll
          warn you in advance
1557 142  how much it will affect your score to accept the
          hints.  Finally, to
1558 142  save paper, you may specify "brief", which tells
          me never to repeat
1559 142  the full description of a place unless you expli-
          citly ask me to.
1560 143  Do you indeed wish to quit now?
1561 144  There is nothing here with which to fill the vase.
1562 145  The sudden change in temperature has delicately
          shattered the vase.
1563 146  It is beyond your power to do that.
1564 147  I don't know how.
1565 148  It is too far up for you to reach.
1566 149  You killed a little dwarf.  The body vanishes in a
          cloud of greasy
1567 149  black smoke.
1568 150  The shell is very strong and is impervious to
          attack.
1569 151  What's the matter, can't you read?  Now you'd best
          start over.
1570 152  The axe bounces harmlessly off the dragon's thick
          scales.
1571 153  The dragon looks rather nasty.  You'd best not try
          to get by.
1572 154  The little bird attacks the green dragon, and in
          an astounding flurry
1573 154  gets burnt to a cinder.  The ashes blow away.
1574 155  On what?
1575 156  Okay, from now on i'll only describe a place in
          full the first time
1576 156  you come to it.  To get the full description, say
          "look".
1577 157  Trolls are close relatives with the rocks and have
          skin as tough as
1578 157  that of a rhinoceros.  The troll fends off your
```

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blows effortlessly.
1579 158 The troll deftly catches the axe, examines it carefully, and tosses it
1580 158 back, declaring, "good workmanship, but it's not valuable enough."
1581 159 The troll catches your treasure and scurries away out of sight.
1582 160 The troll refuses to let you cross.
1583 161 There is no longer any way across the chasm.
1584 162 Just as you reach the other side, the bridge buckles beneath the
1585 162 weight of the bear, which was still following you around. You
1586 162 scrabble desperately for support, but as the bridge collapses you
1587 162 stumble back and fall into the chasm.
1588 163 The bear lumbers toward the troll, who lets out a startled shriek and
1589 163 scurries away. The bear soon gives up the pursuit and wanders back.
1590 164 The axe misses and lands near the bear where you can't get at it.
1591 165 With what? Your bare hands? Against *his* bear hands??
1592 166 The bear is confused; he only wants to be your friend.
1593 167 For crying out loud, the poor thing is already dead!
1594 168 The bear eagerly wolfs down your food, after which he seems to calm
1595 168 Down considerably and even becomes rather friendly.
1596 169 The bear is still chained to the wall.
1597 170 The chain is still locked.
1598 171 The chain is now unlocked.
1599 172 The chain is now locked.
1600 173 There is nothing here to which the chain can be locked.
1601 174 There is nothing here to eat.
1602 175 Do you want the hint?
1603 176 Do you need help getting out of the maze?
1604 177 You can make the passages look less alike by dropping things.
1605 178 Are you trying to explore beyond the plover room?
1606 179 There is a way to explore that region without having to worry about
1607 179 falling into a pit. None of the objects available is immediately
1608 179 useful in discovering the secret.
1609 180 Do you need help getting out of here?
1610 181 Don't go west.
1611 182 Gluttony is not one of the troll's vices. Avarice, however, is.

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```
1612 183  Your lamp is getting dim.  You'd best start wrap-
          ping this up, unless
1613 183  You can find some fresh batteries.  I seem to
          recall there's a vending
1614 183  machine in the maze.  Bring some coins with you.
1615 184  Your lamp has run out of power.
1616 185  There's not much point in wandering around out
          here, and you can't
1617 185  explore the cave without a lamp.  So let's just
          call it a day.
1618 186  There are faint rustling noises from the darkness
          behind you.  As you
1619 186  turn toward them, the beam of your lamp falls
          across a bearded pirate.
1620 186  He is carrying a large chest.  "Shiver me
          timbers!" he cries, "I've
1621 186  been spotted!  I'd best hie meself off to the maze
          to hide me chest!"
1622 186  With that, he vanishes into the gloom.
1623 187  Your lamp is getting dim.  You'd best go back for
          those batteries.
1624 188  Your lamp is getting dim.  I'm taking the liberty
          of replacing the
1625 188  batteries.
1626 189  Your lamp is getting dim, and you're out of spare
          batteries.  You'd
1627 189  best start wrapping this up.
1628 190  I'm afraid the magazine is written in dwarvish.
1629 191  "This is not the maze where the pirate leaves his
          treasure chest."
1630 192  Hmmm, this looks like a clue, which means it'll
          cost you 10 points to
1631 192  read it.  Should I go ahead and read it anyway?
1632 193  It says, "there is something strange about this
          place, such that one
1633 193  Of the words i've always known now has a new
          effect."
1634 194  It says the same thing it did before.
1635 195  I'm afraid I don't understand.
1636 196  "Congratulations on bringing light into the dark-
          room!"
1637 197  You strike the mirror a resounding blow, whereupon
          it shatters into a
1638 197  myriad tiny fragments.
1639 198  You have taken the vase and hurled it delicately
          to the ground.
1640 199  You prod the nearest dwarf, who wakes up grumpily,
          takes one look at
1641 199  you, curses, and grabs for his axe.
1642 200  Is this acceptable?
1643 201  There's no point in suspending a demonstration
          game.
1644 -1
```

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1645	7	
1646	1	3
1647	2	3
1648	3	89
1649	4	10
1650	5	11
1651	6	0
1652	7	1415
1653	8	13
1654	9	94-1
1655	10	96
1656	11	19-1
1657	12	1727
1658	13	101-1
1659	14	103
1660	15	0
1661	16	106
1662	17	0-1
1663	18	0
1664	19	3
1665	20	3
1666	21	0
1667	22	0
1668	23	109-1
1669	24	25-1
1670	25	2367
1671	26	111-1
1672	27	35110
1673	28	0
1674	29	97-1
1675	30	0-1
1676	31	119121
1677	32	117122
1678	33	117122
1679	34	00
1680	35	130-1
1681	36	0-1
1682	37	126-1
1683	38	140-1
1684	39	0
1685	40	96-1
1686	50	18
1687	51	27
1688	52	28
1689	53	29
1690	54	30
1691	55	0
1692	56	92
1693	57	95

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```
1694 58 97
1695 59 100
1696 60 101
1697 61 0
1698 62 119121
1699 63 127
1700 64 130-1
1701 -1
1702 8
1703 1  24
1704 2  29
1705 3  0
1706 4  33
1707 5  0
1708 6  33
1709 7  38
1710 8  38
1711 9  42
1712 10 14
1713 11 43
1714 12 110
1715 13 29
1716 14 110
1717 15 73
1718 16 75
1719 17 29
1720 18 13
1721 19 59
1722 20 59
1723 21 174
1724 22 109
1725 23 67
1726 24 13
1727 25 147
1728 26 155
1729 27 195
1730 28 146
1731 29 110
1732 30 13
1733 31 13
1734 -1
1735 9
1736 0  12345678910
1737 0  100115116126
1738 2  1347389511324
1739 1  24
1740 3  4647485456588828586
1741 3  12212312412512612712812913O
1742 4  8
1743 5  13
1744 6  19
1745 7  424344454647484950 51
1746 7  525354555680818286 87
```

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```
1747 8  99100101
1748 9  108
1749 -1
```

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APPENDIX H: SCORE AND RANK

```
1750 10
1751 35   You are obviously a rank amateur.  Better luck
          next time.
1752 100  Your score qualifies you as a novice class adven-
          turer.
1753 130  You have achieved the rating: "experienced adven-
          turer".
1754 200  You may now consider yourself a "seasoned adven-
          turer".
1755 250  You have reached "junior master" status.
1756 300  Your score puts you in master adventurer class c.
1757 330  Your score puts you in master adventurer class b.
1758 349  Your score puts you in master adventurer class a.
1759 9999 All of adventuredom gives tribute to you, adven-
          turer grandmaster!
1760 -1
```


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APPENDIX I: NUMERICAL CODING

```
1761 11
1762 2  99991000
1763 3  9999500
1764 4  426263
1765 5  521819
1766 6  822021
1767 7  754176177
1768 8  255178179
1769 9  203180181
1770 -1
```


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APPENDIX J: WIZARD'S CAVE

```
1771 12
1772 1    A large cloud of green smoke appears in front of
          you.  It clears away
1773 1    to reveal a tall wizard, clothed in grey.  He
          fixes you with a steely
1774 1    glare and declares, "this adventure has lasted too
          long."  With that
1775 1    he makes a single pass over you with his hands,
          and everything around
1776 1    You fades away into a grey nothingness.
1777 2    Even wizards have to wait longer than that!
1778 3    I'm terribly sorry, but colossal cave is closed.
          Our hours are:
1779 4    Only wizards are permitted within the cave right
          now.
1780 5    We do allow visitors to make short explorations
          during our off hours.
1781 5    Would you like to do that?
1782 6    Colossal cave is open to regular adventurers at
          the following hours:
1783 7    Very well.
1784 8    Only a wizard may continue an adventure this soon.
1785 9    I suggest you resume your adventure at a later
          time.
1786 10   Do you wish to see the hours?
1787 11   Do you wish to change the hours?
1788 12   New magic word (null to leave unchanged):
1789 13   New magic number (null to leave unchanged):
1790 14   Do you wish to change the message of the day?
1791 15   Okay.  You can save this version now.
1792 16   Are you a wizard?
1793 17   Prove it!  Say the magic word!
1794 18   That is not what I thought it was.  Do you know
          what I thought it was?
1795 19   Oh dear, you really *are* a wizard!  Sorry to have
          bothered you . . .
1796 20   Foo, you are nothing but a charlatan!
1797 21   New hours specified by defining "prime time".
          Give only the hour
1798 21   (E.g. 14, not 14:00 or 2pm).  Enter a negative
          number after last pair.
1799 22   New hours for colossal cave:
1800 23   Limit lines to 70 chars.  End with null line.
1801 24   Line too long, retype:
1802 25   Not enough room for another line.  Ending message
          here.
1803 26   Do you wish to (re)schedule the next holiday?
1804 27   To begin how many days from today?
1805 28   To last how many days (zero if no holiday)?
```


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```
1806 29    To be called what (up to 20 characters)?
1807 30    Too small!  Assuming minimum value (45 minutes).
1808 31    Break out of this and save your core-image.
1809 32    Be sure to save your core-image...
1810 -1
1811 0
1812       glorkz4.182/05/11
```

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COMPLETE MAP OF THE BATTERY MAZE IN THE GAME "ADVENTURE"

	WFH	myl	mly	lmy	ylm	yml	lym	mgl	mlg	gml	glm	lmg	BAT
N		mly	glm	gml	myl	lmg	yml	mlg	ylm	lym	mgl	lmy	lmg
S	myl	mgl	mlg	glm	gml	ylm	lmy	mly	yml	lmg	lym	BAT	
E		lym	lmy	mlg	glm	myl	mly	lmg	mgl	yml	ylm	gml	
W		mlg	gml	ylm	yml	mgl	lmg	myl	glm	lmy	mly	lym	
NE		gml	lmg	lym	mlg	mly	mgl	ylm	lmy	glm	myl	yml	
NW		yml	mgl	myl	mly	lym	ylm	gml	lmg	mlg	lmy	glm	
SE		glm	yml	lmg	mgl	mlg	myl	lmy	lym	mly	gml	ylm	
SW		lmy	myl	yml	lym	gml	mlg	glm	mly	ylm	lmg	mgl	
U		ylm	lym	mgl	lmg	lmy	glm	yml	gml	myl	mlg	mly	
D		WFH	ylm	mly	lmy	glm	gml	lym	myl	mgl	yml	mlg	

Abbreviations

WFH west end of featureless hall (at entrance to maze)
BAT chamber in maze containing the battery vending machine

myl	You are in a maze of twisty little passages, all different.
mly	maze of little twisty
lmy	little maze of twisty
ylm	twisty little maze of
yml	twisty maze of little
lym	little twisty maze of
mgl	maze of twisting little
lmg	little maze of twisting
mlg	maze of little twisting
gml	twisting maze of little
glm	twisting little maze of

N	north	NE	northeast
S	south	NW	northwest
E	east	SE	southeast
W	west	SW	southwest
U	up	D	down

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How to use the map

The top row lists all of the locations within the maze, including the entrance (WFH). For any one of these, the column below lists all destinations accessible from that location. To get to any one of these destinations, use the direction in the leftmost column which is in the same row as the desired destination.

For example, to enter the maze from WFH, go south. This takes you to myl. If you want to leave the maze now, go down (which returns you to WFH). There are obviously many ways to get to the batteries and back out again, but none is quicker than this:

Location	Subsequent move
WFH	S
myl	S
mgl	E
lmg	S
BAT	N
lmg	D
mlg	D
myl	D
WFH	

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Analysis of number of unique texts in Adventure

To get some idea of the number of unique texts in Adventure, let us first consider only the battery maze. For the purpose of this calculation the reader is restricted as follows:

(A) (S)he must travel from outside the maze to the battery chamber, passing through all 12 locations in the maze but never entering the same location more than once. (S)he must then exit the maze, again passing through all twelve locations but never entering the same location more than more than once.

(B) Only two valid command types are allowed:

  (a) Movement (e.g., west, down, northeast, etc.)
  (b) Drop object (e.g., drop coins, drop cage, etc.)

(C) The reader must enter with six objects in addition to the lamp (the maximum possible) and drop them anywhere within the maze. The lamp is never dropped.

These restrictions were chosen to simplify the calculation and to eliminate infinite loops and nonsense commands. It should be noted however that texts generated within these restrictions are not unlike texts that are generated during actual explorations of the battery maze. Readers commonly use the trick of dropping objects throughout the maze to render the different locations more easily recognizable.

The number of different texts will be the product of these three quantities:

(1) the number of different paths that can be followed through the maze;

(2) the number of different combinations of 6 portable objects that can be selected from all of the portable objects in the cave;

(3) the number of different ways the six objects can be distributed within the maze.

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The first quantity can be determined by analyzing the structure of the maze. The diagram below is the battery maze map, modified to reflect restriction (A) above.

Map for restricted example:

	WFH	myl	mly	lmy	ylm	yml	lym	mgl	mlg	gml	glm	lmg	BAT
N		mly	glm	gml	myl	lmg	yml	mlg	ylm	lym	mgl	lmy	lmg
S	myl	mgl	mlg	glm	gml	ylm	lmy	mly	yml	lmg	lym	BAT	
E		lym	lmy	mlg	glm	myl	mly	lmg	mgl	yml	ylm	gml	
W		mlg	gml	ylm	yml	mgl	lmg	myl	glm	lmy	mly	lym	
NE		gml	lmg	lym	mlg	mly	mgl	ylm	lmy	glm	myl	yml	
NW		yml	mgl	myl	mly	lym	ylm	gml	lmg	mlg	lmy	glm	
SE		glm	yml	lmg	mgl	mlg	myl	lmy	lym	mly	gml	ylm	
SW		lmy	myl	yml	lym	gml	mlg	glm	mly	ylm	lmg	mgl	
U		ylm	lym	mgl	lmg	lmy	glm	yml	gml	myl	mlg	mly	
D		WFH	ylm	mly	lmy	glm	gml	lym	myl	mgl	yml	mlg	

Consider only the first half of the trip, from the outside to the battery chamber. The reader must enter the maze at location myl. Also, since the battery chamber can only be entered from lmg, the latter must be the penultimate location in the sequence. Therefore the 1st, 11th and 12th locations in the sequence are fixed. However, the 9 remaining locations (those between the vertical lines in the map) can be encountered in any order, as all 9 can be reached from myl and each is connected to all of the others and to lmg (for simplicity of analysis the connections to lmg and myl have been blanked out). The number of different pathways is therefore 9! or 362,880. By analogous arguments the number of pathways for the return half of the trip is also 9!, so the total number of different pathways through the maze to the battery chamber and back out again is $(9!)^2$ or 131,681,894,400

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There are 29 portable objects in the cave. Therefore the number of combinations of 6 objects is:

$$29!/(6!)(23!) = 475,020$$

Each of the six objects may be dropped in any of the 12 locations in the maze, so the number of different ways to distribute the objects is:

$$12^6 = 2,985,984$$

The total number of unique texts is the product of these three quantities:

$$131,681,894,400 \times 475,020 \times 2,985,984$$

$$= 186,777,878,100,000,000,000,000$$

This analysis also assumes that only one name is used for each object. Many of the objects have valid synonyms, and if these are included the number of texts becomes much larger.

The battery maze consists of a small number of highly-interconnected locations. The remainder of the Adventure cave consists of a much larger number of sparsely- and/or conditionally-interconnected locations, wherein a greater variety of actions and consequences are possible. An anlaogous calculation for the rest of the cave would be extremely difficult, but it is probably safe to assume that the number of possible texts one can generate outside the battery maze is much greater than the number one can generate within it. Whatever that immense number is, it must be multiplied by the number of "battery maze texts" to get the total number of possible texts that Adventure can produce.

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